Monthly Variability in the Ocean Habitat off Peru as Deduced from Maritime Observations, 1953 to 1984

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Abstract

Monthly time series, generated from summaries of maritime reports from the region off Peru, are presented for the period 1953 to 1984. These include sea surface temperature, cloud cover, atmospheric pressure, "wind-cubed" index of rate of addition of turbulent mixing energy to the ocean by the wind, wind stress components, solar radiation, long-wave back radiation, evaporative heat loss and net atmosphere-ocean heat exchange. All series are found to undergo interrelated nonseasonal variations at multiyear periods. El Niño episodes are characterized by intense turbulent mixing of the ocean by the wind, intense offshore-directed Ekman transport and by low net heat gain to the ocean through the sea surface. Effects of constant versus variable transfer coefficient formulations on the bulk aerodynamic flux estimates are discussed. Certain comments on the utilization of these data in analysis of biological effects are offered.

Introduction

By international convention, weather observations are recorded routinely on a various types of ships operating at sea. These maritime reports remain the primary source of information on large-scale variability in the marine environment. Even with the increasing development of satellite observation systems, analysis of time series of decadal length and longer must continue to depend heavily on these maritime reports for some time to come. Observations of wind speed and direction, air and sea temperature, atmospheric pressure, humidity and cloud cover included in these reports provide a basis for estimating a number of environmental variables pertinent to the study of variations in ocean climate and of effects of these variations on the associated communities of marine organisms. In this paper, the historical files of these observations are summarized to yield monthly estimates of properties and processes at the sea surface within the extremely productive upwelling ecosystem off central and northern Peru. The 32-year period treated encompasses several dramatic El Niño events and the spectacular rise, collapse, and indications of a recent rebound, of the largest exploited fish population that has ever existed, the Peruvian anchoveta.

Although remarkably rich both in biological productivity and in climatic scale ocean variability, the area off Peru is rather poor in maritime data density. Thus the region presents a particular challenge to the methodologies employed here. The area is very sparsely sampled in comparison to the corresponding eastern ocean boundary ecosystems of the northern hemisphere, with most of the reports coming from a narrow coastal shipping lane lying within about 200 km of the coast (Parrish et al. 1983). Maritime reports are subject to a variety of measurement and transmission errors, of which improper positioning is perhaps the most troublesome, sometimes introducing very large errors in all derived quantities (e.g., when a wrong hemisphere, etc., may

be indicated). And it is difficult to establish effective procedures for rejecting erroneous reports without also suppressing indications of real variations, particularly in the area off Peru which is perhaps uniquely subject to drastic and abrupt natural environmental perturbations. For example, early indications of the 1982-1983 El Niño event went unnoticed by meteorological agencies in Europe and North America, because the reports which clearly indicated an event of unprecedented intensity were so far from the norm that they are rejected as erroneous by the automated data editing procedures (Siegel 1983). In addition, even when no actual errors are involved, irregular distribution of the reports in both time and space may introduce biases and nonhomogeneities into time series constructed from these data.

Tests of the precision of the methodology on intervear time scales, involving subsamplings of the much richer data distributions off the Iberian Peninsula in the northeast Atlantic Ocean, have indicated benefits to be gained by utilizing rather large areal samples, i.e., of the order of 10 degrees of latitude and longitude in extent, with the increase in report frequency overriding increases in sampling variance resulting from incorporation of additional spatial variability (Bakun, unpublished data). These same tests have indicated that the use of the ordinary 'standard error of the mean' provides a useful guide to the precision of monthly estimates, even though the underlying processes may be very highly variable on much smaller temporal and spatial scales than those used for data summarization. For the time series presented herein, reports available within an area extending some 10 degrees of latitude along the Peru coast and about 4 degrees of longitude offshore (Fig. 1), between Talara and a point just to the south of Pisco, were

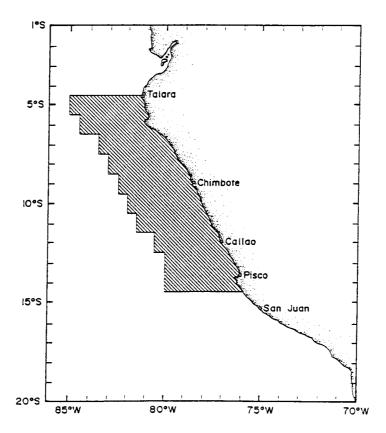


Fig. 1. Summary area, Maritime reports from within the area indicated by diagonal hatching were used for assembling monthly samples.

composited together. These composite samples are assumed to characterize temporal variability, at least in the relative sense, in conditions affecting the neritic fish habitat along that stretch of coastline which appears to have some degree of natural unity both in terms of environmental processes and biological community (Santander 1980; Partish et al. 1983). The rather ragged offshore edge of the summary region was chosen to facilitate initial extraction of the reports from the data archive files. Consistent features of spatial variability tend to be much less intense in offshore areas of coastal upwelling regions than in coastal areas; thus no substantial effect of the irregularity of shape of the offshore boundary is expected. Also all the monthly summaries are treated identically in terms of areal selection and so time series homogeneity is preserved. In any case, report density is extremely low at the outer edge of the summary area.

Assembly of Data Series

Impossible or highly improbable values occur occasionally in the maritime report files, due to keypunch errors, etc. In the data record format, temperature values between -99.9 and 99.90C are possible. Initial efforts to construct the data series resulted in rather large standard errors for certain of the monthly values due to incorporation of improbable data. For this reason, only values falling between the limits 11 to 31°C were accepted as valid observations of air temperature, sea surface temperature, or 'wet bulb' air temperature, for this region. (Note that the lower bound on the wet bulb temperature caused only 16 reports, no more than a single report in any one month, to be rejected). Wind speeds of up to 199 knots (102 m/sec) are possible in the record format. Erroneously high wind speeds have a particularly serious effect since wind speed is squared in the stress computation and cubed in the wind mixing index formulation. Reports of wind greater than 45 knots (23 m/sec) occurred within the summary region less than ten times in the entire 32-year record and were in no case corroborated by neighboring (in either space or time) data. Thus wind reports exceeding this value were excluded in preparing these time series. The data record format limited wind direction to values between 0 and 360 degrees, cloud cover observations to the range 0 to 100% of sky obscured, and barometric pressure to values between 890 and 1,070 millibars.

In assembling the monthly data samples, if any one of the reported values of sea surface temperature, barometric pressure, wind speed, or wind direction, were missing or unacceptable the entire report was excluded from the summaries. These four observed properties are sufficient to produce time series of sea surface temperature (Table 2), atmospheric pressure (Table 4), wind stress components (Tables 5 and 6), and wind mixing index (Table 7). The numbers of reports having acceptable observations of these four items are entered as the first of the three numbers shown for each month in Table 1. In addition, if a valid cloud cover observation was available the report was also incorporated in the cloud cover series (Table 3); numbers of reports including acceptable observations of these five items are entered as the second number of each monthly set in Table 1. Finally, if acceptable values of both air (dry bulb) temperature and either wet bulb or dew point temperature were included, the report was also used for construction of time series of atmosphere-ocean heat exchange components (Tables 8 to 11). Numbers of available reports containing acceptable observations of all seven properties required to construct all the time series presented in this paper are shown as the third number under each month in Table 1. All computations of derived quantities were performed on each individual report prior to any summarization process. A simple mean was taken as an estimate of the central tendency of each monthly sample. Computed standard errors of these mean values are displayed within the parentheses following each monthly value presented in the various data tables. An approximate 95% confidence interval estimate can thus be generated by multiplying the indicated standard error by the factor 1.96, and adding and subtracting the result from the monthly mean value (point estimate) to yield the upper and lower limits of the interval.

A small percentage of the reports contain wind observations in which the direction is noted as "variable"; i.e., no direction could be assigned. This properly occurs only when the wind speed is very low. In these cases the wind speed is used, as reported, in the calculations where it enters as a scalar quantity, i.e., in the calculations of wind mixing index, evaporative heat loss and conductive heat loss. In the computation of surface wind stress, wind enters as a vector

quantity and directionality is crucial. Accordingly, for the surface wind stress calculations, variable winds are treated as calms. Because the wind speed enters the calculation as a "square", low wind values act essential as zeros in their effect on the monthly means, and so treating these weak variable wind observations as calms has no substantial effect. Also, the net effect of a stress from one direction is cancelled by an equal stress from the opposite direction, and so treating variable-directional stress as equivalent to calm conditions makes physical sense.

Sea Surface Wind Stress

Sea surface stress was estimated according to:

$$(\tau_{x}, \tau_{y}) = \rho_{a} C_{D} (|\vec{W}_{10}| U_{10}, |\vec{W}_{10}| V_{10}) \qquad \dots 1)$$

where τ_x and τ_y are components of stress directed onshore and alongshore, respectively; a characteristic onshore direction of 62 degrees and an alongshore direction of 332 degrees (from true north) was assigned to the entire summary area. P_a is the density of air, considered constant at 1.22 kg/m³. CD is a dimensionless drag coefficient. $|W_{10}|$ is the wind speed at 10 m height. U10 is the onshore-directed component of wind velocity; V10 is the alongshore-directed (positive equatorward) component. For the data series presented in the tables, CD was considered to be a constant equal to 0.0013. The use of this constant drag coefficient has been a somewhat standard practice in climatological studies of upwelling regions (Bakun et al. 1974; Nelson 1977; Parrish et al. 1983). However, it is recognized that the value of the drag coefficient is actually a variable which depends on the nature of atmospheric turbulence near the sea surface. Thus a dependence on both atmospheric stability and wind magnitude near the sea surface is indicated; the stability effect is particularly important in reducing air-sea transfers in upwelling regions due to the stable atmospheric boundary layer formed over cool upwelled surface water. No clear consensus as to the proper formulation of these dependencies is presently available. However, a reasonable variable drag coefficient formulation has been chosen and has been applied to these data for evaluation of possible differences from results based on the constant drag coefficient formulation. In this case we follow the method of Nelson (1977) for incorporation of the atmospheric stability effect, which is based on a bulk Richardson number parameterization (Deardorff 1968). We incorporate a dependence on wind speed according to the recommendations of Large and Pond (1981) who find a linear increase in the drag coefficient at wind speeds greater than 11 m/sec.

Offshore Ekman Transport

In their climatological study of seasonality and geography of anchovy and sardine reproductive habitats within eastern ocean boundary upwelling systems, Parrish et al. (1983) found a pattern of minimization of both wind-driven offshore surface flow (Ekman transport) and of wind-induced turbulence in the spawning habits of these fishes. They therefore suggest the likelihood of important effects of both processes on reproductive success. Offshore Ekman transport at a given latitude is proportional to the alongshore stress, being simply the product of the alongshore stress and the reciprocal of the local Coriolis parameter. Ekman transport (Ekman 1905) provides an acceptable description of ocean surface transport directly driven by surface wind stress at periods which are long compared to the half-pendulum day; the half-pendulum day is 2.9 actual days in length at 100 latitude but increases to infinity at the equator. Obviously, the Ekman transport description cannot be applied directly at the equator. Here we assume the Ekman transport description to be adequate for the effect of wind stress variations affecting the summary area as a whole on the monthly time scale; thus we simply divide the monthly alongshore wind stress by a characteristic value of the Coriolis parameter (we choose the local value at 100S, i.e., 0.0000253/sec, to characterize offshore Ekman transport in response to largescale, long period wind variations over the anchoveta reproductive habitat; this choice will affect

the average magnitude but not the time series properties of the resulting indicator series, which will be identical to those of the alongshore stress series).

Wind Mixing Index

The rate at which the wind imparts mechanical energy to the ocean to produce turbulent mixing of the upper water column is roughly proportional to the third power, or "cube", of the wind speed (Elsberry and Garwood 1978). A "wind mixing index", which is simply the mean of the cube of the observed wind speeds in each monthly sample (Table 7) is presented as a guide to longer period variability in this particular process. However, it is to be noted that these series may not reflect energetic shorter-term variability which may be more crucial to reproductive success of anchovies (Husby and Nelson 1982). The hypothetical basis for interest in this process in relation to anchoveta reproductive success is Lasker's (1978) suggestion that first-feeding success of anchovy larvae may be dependent upon availability of fine scale food particle concentrations which may be dispersed by wind-driven turbulent mixing events. These occur at atmospheric storm event scales which are much shorter than one month. Furthermore, it is not the exact magnitude of mixing that is crucial according to this hypothesis, but rather the existence of time-space "survival windows" within which the rate of addition of turbulence by the wind does not reach a level that homogenizes the food particle distributions (Bakun and Parrish 1980). The wind speed level at which this occurs and the minimum required duration of the window for substantial survival to result are unclear and undoubtedly are variable functions of other factors such as water column stability, the particular food particle organism's growth rate, behavior, motility, etc. In any case, the maritime reports occur irregularly in time and space and so are not amenable to indicating durations of periods characterized by specific conditions, even if we were able to specify the required nature of the conditions. This would require utilization of a time-and-space continuous meteorological analysis procedure (Bakun 1986) which might be ineffective due to the low maritime report density in the region and particularly seaward of the region. The use of shore station data, despite interference from local topographic influences, etc., might be the best available option for indicating short time scale wind variability over the ocean habitat off Peru (see Mendo et al., this vol.).

Solar Radiation

Net incoming solar radiation, QS, absorbed by the ocean was estimated according to the formula:

$$Q_S = (1 - \alpha) Q_\alpha (1 - 0.62C + 0.0019h)$$
 ...2)

where α is the fraction of incoming radiation reflected from the sea surface, Q0 is the sum of the direct and diffuse radiation reaching the ground under a cloudless sky, C is the observed total cloud amount in tenths of sky covered and h is the noon solar altitude. For each maritime report, the total daily direct solar radiation reaching the ground under cloudless conditions was extracted from the Smithsonian Meteorological Tables (List 1949) as a function of the date and latitude of the report, using a 4 x 4 element curvilinear interpolation on the table entries via Bessel's central difference formula and assuming the atmospheric transmission coefficient of 0.7 recommended by Seckel and Beaudry (1973). The diffuse solar radiation was estimated according to List's recommendations as follows. The solar radiation reaching the top of the atmosphere was extracted from the appropriate table. This value was decreased by 9% to allow for water vapor absorption and 2% for ozone absorption. The result is subtracted from the value previously determined for the direct radiation reaching the ground to yield the energy scattered out of the solar beam. This is reduced by 50% (to reflect the fact that half is diffused upward and therefore only half is diffused downward) to yield the total diffuse solar radiation reaching the ground. The total daily direct and diffuse radiation values corresponding to each report are then summed to

yield Qs. The remainder of the computation follows the procedures adopted by Nelson and Husby (1983). The linear cloud correction in Equation (2) is as suggested by Reed (1977), and Reed's recommendation that no correction be made for cloud amounts less than 0.25 of total sky was followed. Sea surface albedo was extracted from Payne's (1972) tables, following Nelson and Husby's (1983) algorithm which consists of entering the tables with the 0.7 atmospheric transmission coefficient reduced by a factor equal to the linear cloud correction applied in Equation (2) and the mean daily solar altitude. The possible error in the net radiation estimate introduced by using the mean daily solar altitude to indicate albedo, rather than an integration over the entire day of entries at short time intervals with instantaneous solar altitudes, is estimated to be of the order of 1%.

Radiative Heat Loss

Effective back radiation is the difference between the outgoing long-wave radiation from the sea surface, which depends on the 4th power of the absolute temperature of the sea surface, and the incoming long-wave radiation from the sky, which depends on the water vapor content of the atmosphere and on the nature of the cloud cover. Here we follow exactly the computational scheme of Nelson and Husby (1983) who used the modified Brunt equation (Brunt 1932) with the empirical constants of Budyko (1956) and the linear cloud correction formula of Reed (1976) to compute the effective back radiation (radiative heat loss), QB:

$$Q_B = 5.50 \times 10^{-8} (T_S + 273.16)^4 (0.39 - 0.05e_a^{-1/2}) (1 - 0.9C)$$
 ...3)

The vapor pressure of the air, e_a , was computed according to the formula provided in the Smithsonian Meteorological Tables (List 1949) using the observed barometric pressure, and "dry bulb" and "wet bulb" air temperatures. For reports that were without an acceptable wet bulb temperature but included an acceptable dew point temperature, the vapor pressure was computed as the saturation vapor pressure at the dew point temperature using an integrated form of the Clausius-Clapeyron equation (Murray 1967).

Evaporative and Conductive Heat Losses

In estimating evaporative heat loss (latent heat transfer) and conductive heat loss (sensible heat transfer), the procedures of Nelson and Husby (1983) are again followed closely, except for a modification of the wind speed dependence in their variable transfer coefficient formulations as indicated below. The bulk aerodynamic formula for turbulent fluxes of latent and sensible heat across the air-sea interface in a neutrally stable atmospheric boundary layer (Kraus 1972) can be expressed as

$$Q_{E} = \rho_{a} LC_{E} (q_{0} - q_{10}) |\widetilde{W}_{10}| \qquad \dots 4)$$

$$Q_{C} = \rho_{a} c_{p} C_{H} (T_{3} - T_{a}) |\vec{W}_{10}|$$
 ...5)

where ρ_a and $|\vec{W}_{10}|$ are as in Equation (1), with ρ_a assigned the same constant value (1.22 kg/m³) as in the stress computation. L is the latent heat of vaporization, assigned a constant value of 2.45 x 106 J/kg (585.3 cal/gm). c_D is the specific heat of air, assigned a constant value of 1,000 J/kg/oC (0.239 cal/g/oC). The empirical exchange coefficients, CE and CH, were assigned constant values of 0.0013 in the construction of the time series presented in Tables 10 and 11. In addition, time series based on variable transfer coefficient formulations incorporating dependencies on atmospheric stability and on wind speed were also assembled for comparison. These formulations are again those chosen by Nelson and Husby (1983) which incorporate the

atmospheric stability effect according to a bulk Richardson number parameterization (Deardorff 1968); however, Nelson and Husby's wind speed dependencies were in this case modified according to the recommendations of Large and Pond (1982) who suggest an increase in CE and CH which is proportional to the square root of the wind speed. The specific humidities of the air in contact with the sea surface, q₀, and at 10 m or deck level, q₁₀, were computed according to

$$q \approx E \frac{e}{P}$$
 ... 6

where E is the known ratio (a constant equal to 0.622) of the molecular weight of water vapor to the net molecular weight of dry air, e is the vapor pressure and P is the barometic pressure. For this calculation the variation in P is negligible and so a constant value of 101.325 pascals (1,013.25 mb) was assigned. The calculation of e at 10 m, or deck level, is as indicated for the radiative heat loss calculation (Equation 3). To calculate e at the sea surface, the saturation vapor pressure over pure water was computed from a formula given by Murray (1967), and reduced by 2% to account for the effect of salinity (Miyake 1952).

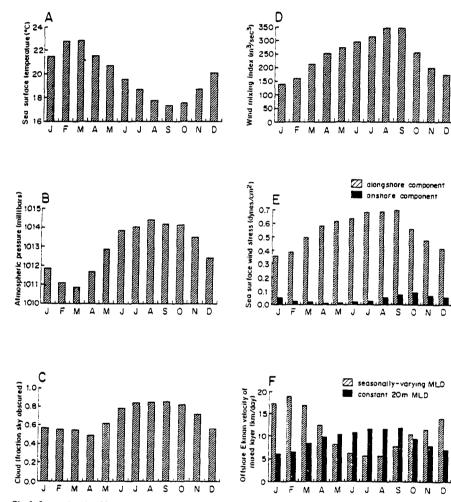


Fig. 2. Seasonal cycles. 32-yr mean monthly values.

The Seasonal Cycles

The idea of regular seasonal cycles for the coupled ocean-atmosphere system off Peru is to some degree illusory in view of the predominant influence of interyear variability in the region. However, the seasonal variation is the most cyclic and predictable of the large components of variability. It is therefore the component of variation which is most likely to be reflected in biological adaptations. Accordingly, a summary of the long-term mean monthly values of the various series (Figs. 2 and 3) serves as a useful starting point for discussion.

Being situated within the tropical band, the region experiences two passages of the sun each year; the sun is directly overhead in October and again in February-March. Also, since the earth's meteorological equator is displaced to the north of the geographical equator, the region is dominated by southern hemisphere atmospheric dynamics; thus austral winter dominates the seasonality of transfers of momentum and mechanical energy from atmosphere to ocean.

The 32-year mean monthly sea surface temperature (Fig. 2A) is at a maximum in March, coinciding with the second period of vertical sun which marks the culmination of the extended austral summer period of relatively high sun. The temperature falls to a minimum in August. The atmospheric pressure (Fig. 2B) tends to be directly out of phase, being at a minimum in the austral summer and at a maximum in the winter season. Cloudiness (Fig. 2C) lags the atmospheric pressure variation by about one month. On average less than 50% of the sky is obscured by clouds in April; this increases to greater than 85% in September.

The strength of the wind exhibits a typical southern hemisphere seasonality, being strongest in austral winter and weakest in summer. Thus the 32-year mean monthly values of the index of rate of addition of turbulent mixing energy to the water column (Fig. 2D) reach a maximum in August-September and a minimum in January. The fact that the seasonal spawning peak of anchoveta is centered within this August-September turbulent mixing maximum would indicate non-adaptation of reproductive strategy for minimization of turbulent mixing effects. This is not in accordance with the general pattern suggested by Parrish et al. (1983) as generally characterizing seasonality and geography of spawning of eastern ocean boundary anchovy populations. Although no claim is made for conclusiveness, the inference would seem to be that Lasker's (1978) hypothesis is not, at least in most years, the major factor affecting anchoveta reproductive success off Peru. Note that the level of turbulent mixing index intensity off Peru is low compared to other anchovy reproductive habitats, even at its seasonal maximum.

The alongshore component of wind stress on the sea surface is consistently equatorward; in no case in the 32-year series (Table 5) did any monthly wind mean stress value deviate from this predominently alongshore and equatorward tendency in the transfer of momentum from atmosphere to ocean. The long-term mean values of alongshore stress (Fig. 2E) follow the same seasonal pattern as the turbulent mixing index, reaching a maximum in September and a minimum in January. The 32-year mean monthly values of the onshore component of stress are small compared to those of the alongshore component, but are positive (onshore-directed) at all

Surface Ekman transport, being proportional to the alongshore stress but directed perpendicularly to the left of the stress, is thus directed offshore, with a seasonal maximum again corresponding to the seasonal spawning peak of anchoveta. This "anomaly" to the pattern of apparent minimization of offshore transport in spawning strategies of engraulids puzzled Bakun and Parrish (1982). However, Parrish et al. (1983) showed that the seasonal variation in mixed layer depth off Peru proceeds in phase with that of transport, in response to the seasonalities in turbulent mixing (Fig. 2C) and surface cooling (Fig. 2A), but has greater relative amplitude. The result is that drifting organisms which are distributed through the upper mixed layer would experience a faster net offshore drift in the thinner surface mixed layer of austral summer than in the deeper mixed layer of winter, even though the winter transport (by volume) is much larger. This is illustrated in Fig. 2F, which shows calculations of mean monthly offshore Ekman velocity of the mixed layer performed in two different ways (based on the 32-year mean monthly values of the data presented in Table 5). Firstly, the monthly estimates of offshore Ekman transport are divided by the composite mean (20 m) of the mixed layer depth values given for 2month segments of the seasonal cycle by Parrish et al. (1983). Secondly, the same monthly estimates of offshore Ekman transport are divided by monthly mixed layer depth estimates

produced by curvilinear interpolation of the 2-month seasonal segments. The effect of variable mixed layer depth on the net offshore velocity is apparent, and suggestive of adaptation of spawning seasonality for avoidance of offshore loss of larvae (for additional discussion of this aspect, see Bakun 1985). The effect of the choice of a constant or variable drag coefficient formulation in the stress computation (Equation 1) on the seasonal signal is indicated in Fig. 3A. The 32-year mean monthly Ekman transport values based on the variable coefficient formulation follow a seasonal progression which is very similar to those based on the constant coefficient formulation (i.e., presented in Table 5); however they are slightly smaller in magnitude, reflecting the effect of stability in the atmospheric boundary layer which is stabilized as the onshore-directed airflow is cooled from below while traversing the coastal upwelling zone.

Solar radiation entering the ocean (QS) is at a maximum during the February overhead passage of the sun (Fig. 3B). This is due to substantially reduced cloud cover relative to the November solar passage. Solar radiation is at a minimum in July, when solar altitude has just passed its June minimum, and cloudiness is approaching its winter maximum.

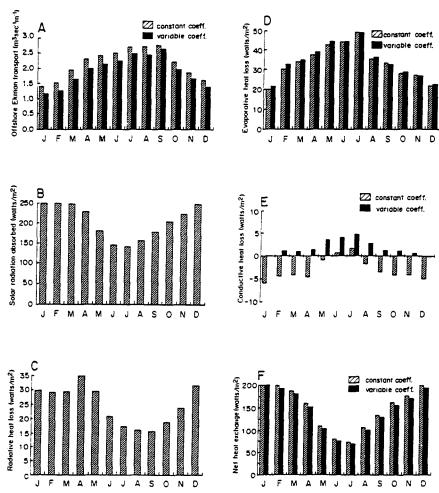


Fig. 3. Seasonal cycles. 32-yr mean monthly values. (Note that the SI-standard heat flux units, watts per square meter, may be converted to calories per square centimeter per day by multiplying by the factor 2.604)

Heat loss from the sea surface via long-wave radiation (QB) is only a small fraction of the short-wave radiation absorbed reflecting the area's location within the tropical band (Fig. 3C). Radiative heat loss is at a seasonal maximum during April, corresponding to the minimum in cloudiness, and at a minimum in September, corresponding to the cloudiness maximum.

Heat loss from the ocean via evaporation at the sea surface (QE) is at a maximum during austral winter and at a minimum during summer (Fig. 3D). The choice of constant or variable transfer coefficient has only a slight effect, with the results of the variable coefficient formulation appearing to increase very slightly in magnitude relative to those of the constant coefficient formulation toward the summer and fall seasons.

Heat loss via conduction (QC) is very small compared to the other heat exchange components (Fig. 3E). This is fortunate because the choice of transfer coefficient formulation completely changes the seasonal pattern. With the constant coefficient formulation, conductive heat loss is mostly negative, indicating heating of the ocean surface by contact with the atmosphere. This reflects the common situation of cool upwelling-affected surface waters being in contact with a generally warmer atmosphere. However, the strong stability of the atmosphere boundary layer inherent in this situation inhibits conductive heat transfer according to the variable transfer coefficient formulation. Thus the less common situation where the air is cooler than the water dominates the sensible heat transfer according to the variable coefficient formulation, with the result that conductive heat loss is indicated as being positive in all the 32-year composite monthly means except the summer months of January and February.

The 32-year monthly means of the time series of atmosphere-ocean heat exchange (QN), which represent the resultant differences between the amount of solar radiation absorbed by the ocean and the sum of the heat losses due to long-wave radiation, evaporation and conduction, indicate substantial heat gain by the ocean throughout the year (Fig. 3F). As expected, the average heat gain is greatest in austral summer, reaching values of the order of 200 watts/m² (413 cal cm⁻² day⁻¹) in January, and least in winter, falling to about 70 watts/m² (144 cal cm⁻² day⁻¹) in July. The constant coefficient formulations yield slightly greater numerical values of net heat exchange than do the variable coefficient formulations, mainly due to the differences in the respective indications of the conductive heat loss component discussed in the previous paragraph; however the respective seasonal progressions are very similar.

Intervear Variations

If cyclical seasonal effects are those most likely to be adapted for and incorporated in life cycle strategies of organisms, major nonseasonal variations are those most likely to cause disruptions in life cycle processes and therefore to be reflected in population variations. Very short-scale nonseasonal variations are not well resolved in these monthly composites of irregularly distributed maritime reports. However, when shorter period variability is smoothed and the cyclic seasonal effects are suppressed, nonseasonal variations of longer than annual period, which represent substantial perturbations of the environmental "normalcy" to which reproductive strategies or other life cycle strategies should have become tuned, are clearly manifested. For the purposes of this discussion, a simple 12-month running mean filter is chosen to suppress seasonalities and smooth the higher frequencies.

Problems (negative side lobes, wavelength-dependent phase shifts, etc.) with such equally-weighted moving average filters are well known (Anon. 1966). However, in this case the alternatives also present problems. We particularly wish to suppress the seasonal cycle, and so weighting the filter elements to suppress side lobes at other frequencies while increasing leakage of the seasonal frequency, is not desirable. Smoothed monthly series of anomalies from long-term monthly means (e.g., Quinn et al. 1978; McLain et al. 1985) have the property that the filtering is "nonlocal", i.e., that any value is dependent on other values in the same calendar month in temporally "distant" parts of the time series. Thus, for example, an intense warming (e.g., El Niño) occurring within a generally cool climatic period appears as a much less intense anomaly than a warming of similar magnitude within a warm period; also, the degree of indicated intensity changes whenever the length of the series used for determination of the long-term mean changes. More importantly, if the amplitude (or shape, phase, etc.) of the seasonal

variation is undergoing nonseasonal variation, taking anomalies introduces spurious seasonal-scale variations into the filtered series. A "local" seasonal filter that avoids some of these problems can be based on 12th-differences, e.g., the result of subtracting from each monthly value the value for the same calendar month in the previous year, but the result is thereby transformed to annual rates of change of a property rather than the property itself, which complicates a descriptive discussion. However, the use of 12th-difference transforms is worth considering for empirical modelling efforts. For the purposes of this discussion, the simple 12-month running mean provides a "local" seasonal filter/smoother which will be familiar to many readers and adequate for a descriptive treatment.

The filtered sea surface temperature series (Fig. 4A) illustrates well the major El Niño warm events of the period: 1957-1958, 1965, 1969, 1972-1973, 1976 and 1982-1983. Generally elevated temperatures in the period between the 1976 and 1983 events are also apparent. Also apparent is the extended cold period of the mid-1950s; the indication of rise in temperature from this cold period to the peak of the 1957-1983 El Niño is comparable in total magnitude to that of the rise of the 1982-83 El Niño from the much warmer climatic base temperature level of the late 1970s.

Major features in the filtered cloud cover series (Fig. 4B) are visibly related to those in the temperature series, but not in any simple, consistent manner. Cloud cover minima often appear to coincide with the relaxation of El Niño events. An extraordinarily low degree of cloudings appears to have coincided with the return to normal sea temperatures in 1984. Another sharp cloud cover minimum coincided with the leveling off of the temperature decline following the 1957-1958 event. Likewise cloud cover maxima often appear to coincide with rapid drops of temperature into cool periods. Atmospheric pressure variations (Fig. 4C) are obviously highly inversely correlated, at these low frequencies, with those of sea surface temperature.

It is not surprising, in view of the dynamic linkage of wind to horizontal gradient of atmospheric pressure, that wind variations would be related to those of atmospheric pressure. The relation of the "wind-cubed" index of rate of addition of turbulent mixing energy to the ocean by the wind (Fig. 4D) to El Niño periods is striking. El Niño events are evidently strong wind-mixing events which, according to Lasker's (1978) scenario, would correspond to periods of high probability of starvation for first-feeding anchoveta larvae. The period during and immediately following the 1972 El Niño appears to have been characterized by an extended period of highly turbulent upper water column conditions. The period during and following the 1982-1983 event appears to have been similarly turbulent, except for a 2-month "window" of relaxed turbulent mixing index during December 1983 and January 1984 (somewhat masked by the smoothing in Fig. 4C, but evident in the unsmoothed monthly values in Table 7).

The magnitude of alongshore (equatorward) wind stress also increases during El Niño events (Fig. 4E), in agreement with Wyrtki's (1975) conclusions which were based on a summary area displaced somewhat southward along the coast (10-200S, 70-800W) from the one used here (Fig. 1). Thus in addition to potential increases in larval starvation due to increased destruction of food particle strata by turbulent mixing, an increase in potential offshore loss of larvae from the favorable coastal habitat is also indicated. The onshore component of surface wind stress is relatively small and consistently positive (onshore-directed) in the filtered series.

In the previous section, the effect of seasonally-varying mixed layer depth on the offshore Ekman velocity of particles which are continually mixed through the upper mixed layer was discussed (i.e., in reference to Fig. 2F). To investigate the effect on intervear time scales, filtered time series of offshore Ekman velocity were calculated as in that section, i.e., (i) assuming a constant MLD of 20 m and (ii) assuming a seasonally varying MLD derived from the values given by Parrish et al. (1983). The result indicates that, at least for the MLD values chosen, the effect of seasonally-varying mixed layer depth is such as to substantially increase on average the rate of offshore movement of passive particles in the mixed layer. If the effective mixed layer depth is increased during El Niño, as would be expected both from the effect of the propagating baroclinic wave in deepening the surface layer and also from the enhanced wind induced turbulent mixing, the effect would be to counteract the increased rate of offshore movement indicated from the Ekman transport calculations.

The effect of the choice of constant or variable drag coefficient formulation in the stress computation (Equation 1) is illustrated in Fig. 4G, where the alongshore stress variation is

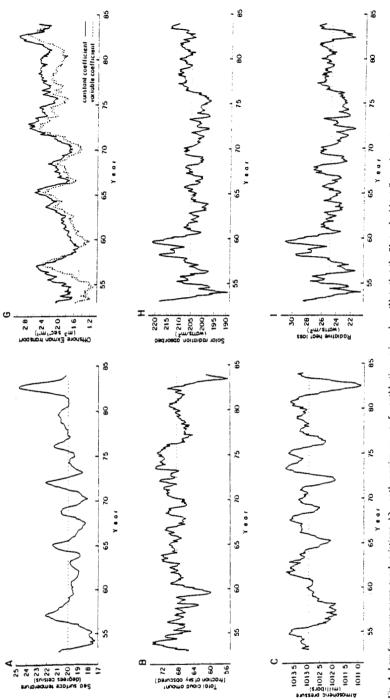


Fig. 4. Low-frequency nonseasonal variations, 12-month running means of monthly time series values. (Note that the SI-standard heat flux units, watts per square meter, may be converted to calories per square centimeter per day by multiplying by the factor 2.064.)

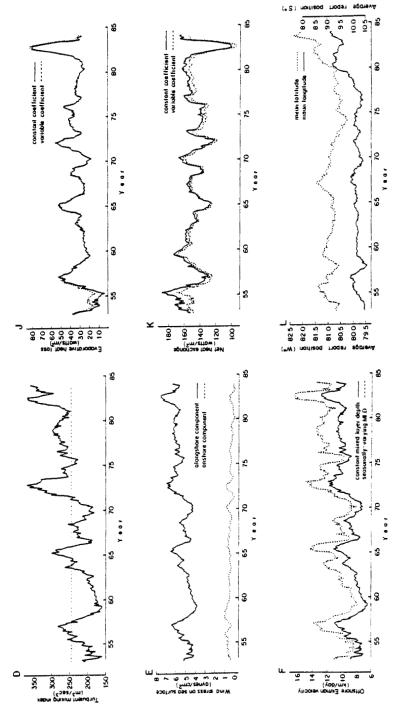


Fig. 4. Continued. Low-frequency nonseasonal variations, 12-month running means of monthly time series values. (Note that the SI-standard heat flux units, watts per square meter, may be converted to calories per square centimeter per day by multiplying by the factor 2.064.)

plotted in terms of its directly proportional transform, offshore Ekman transport. The variable coefficient formulation produces generally lower estimates of stress due to the influence of the stability of the lower atmospheric boundary layer over upwelling-affected surface waters. However the differences essentially disappear during the period of relaxation of the intense El Niños of 1957-1958 and 1982-1983. A possible explanation is the tendency for a less stable atmosphere in contact with the ocean surface due to residual warmth which would linger longer in the ocean than in the atmosphere due to the much greater heat storage capacity of water compared to that of air.

The filtered series of estimates of absorption of solar radiation by the ocean (QS) exhibits some interesting patterns (Fig. 4H). Since the variables that control the solar radiation estimate (Equation 2) derived from a maritime report at any given latitude are calendar date and cloud cover, it is not surprising that maxima in Fig. 4H often correspond to minima in Fig. 4B, and vice versa. However there are discernible differences between the two series that result from the interaction of the cloud cover variations with the seasonal changes in solar height in the solar radiation time series. An impressive feature in the solar radiation series is the early large-amplitude alternation consisting of deep minimum of solar radiation entering the ocean corresponding to the early part of the intense 1954-1955 cold period, followed by a sharp, highly erratic rise to a high peak in early 1960. In addition, the entire period of the 1960s and the first half of the 1970s appears to have been characterized by low absorption of solar radiation relative to the more recent period since 1976.

The long-wave radiative heat loss (QB) tends to be an order of magnitude smaller than the short-wave absorption, but varies very similarly (Fig. 4I). This similarity is perhaps explainable in the similar dependence of both types of estimate on cloud cover, with the sea surface temperature dependence in the long-wave radiation estimate (Equation 3) being related seasonally to the solar height dependence in the solar radiation estimate (Equation 2). There may also be some actual causal effect of the long period variations in solar radiation on the sea temperature dependence in the long-wave radiation estimate.

The filtered series of evaporative heat loss (QE) delineates the various El Niño episodes and the 1954-1955 cold period, in a very similar fashion to the sea surface temperature series (Fig. 4J). The long-term variation in vapor pressure difference between the sea surface and the overlying atmosphere (Equation 4) is apparently very closely linked to that of sea surface temperature. As discussed above, the wind speed dependence is also a strong function of these climate scale events. The effect of choice of constant or variable transfer coefficient apparently makes very little difference, except during the mid-1950s cold period, where increased stability of the air over the cold ocean apparently inhibited the turbulent exchange of latent heat according to the variable coefficient formulation.

The net ocean-atmosphere heat exchange series (QN) indicates long-term variations in net ocean heat gain such that minima are associated with El Niño episodes and maxima with cold periods. The variations appear to be controlled to a substantial extent by the evaporative heat loss (Fig. 4J). This is so because the variations in heat gain by absorption of short-wave solar radiation (Fig.4H) are partially offset by the highly correlated variations in long-wave radiative heat loss (Fig. 4I). The net effect of the choice of variable or constant transfer coefficient formulations in the evaporative and conductive components is a slight general lowering of the magnitude of net heat gain in the variable coefficient case. This difference is due primarily to the stability effect on the conductive heat loss term, as discussed in the previous section in reference to Fig. 2E, where the average change in the mean net value of this component, approximately 5 watts/m², corresponds in general to the approximate difference between the curves in Fig. 4K, except in the mid-1950s where stability effects on the evaporative heat loss term are appreciable.

In order to check for long-period variations in the distribution of observations within the summary area (Fig. 1), filtered series of the monthly averages of the respective latitudinal and longitudinal locations of reports were prepared (Fig. 4L). Since the coastline is oriented somewhat northwest to southeast, variations in the two curves which tend to parallel each other in the figure, will tend to yield a resultant displacement in the alongshore direction. More serious with respect to the long-term homogeneity of the monthly series herein presented are variations in Fig. 4L where the curves are changing in the opposite sense, i.e., where the net displacement of the mean position of reports is in the onshore-offshore direction; these situations are

Table 1. Numbers of observations in monthly samples used to construct time series. For each month the first number refers to observations used in constructing the values in Tables 2,4,5,6 & 7 (sea temperature, atmospheric pressure, wind stress components, and "wind cubed" index: the 2nd number refers to observations used in constructing the values in Table 4 (cloud cover); the 3rd number refers to observations used for values in Tables 8,9,10 & 11 (heat exchange components).

		Jan			Feb			Mar			Apr			May			Jun	
1953	21		19		29	29		22	19		23			33			16	- 6
1954	61		40			17		21	21		59			39	_		34	24
1955	24		20		35			15	12		9 39			24 22	13 16		35 20	30 7
1956 1957	41 32	38	15		15 24	15		16	. 3		38			25	21		52	33
1957	153		32		73	15		98	47		84	29		66		1110	107	52
1958	128		106	162		. 44		69	34		112			96	21		67	43
1959	98	95		1148	162 146		143	138		1115	146		171	164	135		82	59
1961	148			124	124		1166	166		151 183	180			86		130	128	104
1962	185			149	148		163			157	155		114	111		177	177	147
1963	78	76		103	102		182			180			157	156		185	185	185
1964	129	129		138	137		82	81	81		76		45	45		52	52	52
1965	59	59	58		71		137		137		99		139	136		139	139	138
1966	107		107		82			112		106			117	113		1137	137	137
1967	111		102		52		80	80		147	144	144		74	74		66	66
1968	76	76		128	127		108	108		139	137			87		111		108
1969	67	67	67		84		134	131	131		91	91		56		102		102
1970	90	87	82		57		103	100	90		51	48		98		208	206	200
1971	103	101	93		77		89	89	89		53	52		44	44		22	21
1972	109	108	104		52	51		49	47		85	85		81	81	56	56	56
1973	55	54	40	1 44	44	39	89	89	89	50	50	48	58	58	56	57	54	47
1974	84	78	78	63	63	58	113	109	100	57	54	54	1119	118	117	73	72	72
1975	59	57	56	73	72	69	140	140	140	99	92	90	140	138	136	1116	115	114
1976	70	69	68	20	19	19	76	73	71	59	59	55	71	71	70		44	40
1977	51	51	51	109	106	105	79	79	73	101	99	94	93	88	87	70	70	69
1978	57	56	56	65	65	62	71	69	67	92	92	88	71	71	71		40	35
1979	97	96	89	58	57	51	105	104	98	85	85	77	83	80	74		45	34
1980	96	93		106	105		125	123	102		70		151	146		246	201	98
1981	116	113	85		89		139	137	124		103		1115	108		128	124	108
1982	91	89	82		90			146	139		98		103	98	80		54	41
1983	68	64		126	126	116		91	86		72	61		92	83		61	55
<u> 1984 </u>	90	75	26	99	80	39	90	59	14	75	41	16	58	_39	6	56	49	29
7050		Jul			Aug			<u>Sep</u>			oct			Nov			Dec	
1953	10	10	9		35	26	29	28	25	18	18	11		24	18		18	11
1954	40	10 39	38	14	35 14	10	27	28 26	22	46	18 43	37	30	24 30	6	18	18 18	9
1954 1955	40 17	10 39 17	38 12	14 37	35 14 36	10 21	27 35	28 26 35	22 6	46 45	18 43 44	37 34	30 27	24 30 27	6 20	18	18 18 13	9 5
1954 1955 1956	40 17 45	10 39 17 45	38 12 36	14 37 21	35 14 36 21	10 21 21	27 35 29	28 26 35 29	22 6 21	46 45 41	18 43 44 40	37 34 29	30 27 63	24 30 27 61	6 20 20	18 13 24	18 18 13 24	9 5 6
1954 1955 1956 1957	40 17 45 27	10 39 17 45 27	38 12 36 11	14 37 21 24	35 14 36 21 24	10 21 21 21	27 35 29 64	28 26 35 29 64	22 6 21 38	46 45 41 112	18 43 44 40 110	37 34 29 65	30 27 63 100	24 30 27 61 99	6 20 20 53	18 13 24 115	18 18 13 24 115	9 5 6 86
1954 1955 1956 1957 1958	40 17 45 27 51	10 39 17 45 27 51	38 12 36 11 27	14 37 21 24 159	35 14 36 21 24 159	10 21 21 21 83	27 35 29 64 96	28 26 35 29 64 93	22 6 21 38 44	46 45 41 112 113	18 43 44 40 110 108	37 34 29 65 47	30 27 63 100 115	24 30 27 61 99 110	6 20 20 53 63	18 13 24 115 58	18 18 13 24 115 43	9 5 6 86 26
1954 1955 1956 1957 1958 1959	40 17 45 27 51	10 39 17 45 27 51 100	38 12 36 11 27 57	14 37 21 24 159	35 14 36 21 24 159 101	10 21 21 21 83 39	27 35 29 64 96 85	28 26 35 29 64 93 81	22 6 21 38 44 42	46 45 41 112 113 74	18 43 44 40 110 108 74	37 34 29 65 47	30 27 63 100 115 110	24 30 27 61 99 110	6 20 20 53 63 55	18 13 24 115 58 114	18 13 24 115 43 114	9 5 6 86 26 85
1954 1955 1956 1957 1958 1959	40 17 45 27 51 100 169	10 39 17 45 27 51 100 168	38 12 36 11 27 57 147	14 37 21 24 159 103	35 14 36 21 24 159 101	10 21 21 21 83 39	27 35 29 64 96 85 142	28 26 35 29 64 93 81 142	22 6 21 38 44 42 94	46 45 41 112 113 74 75	18 43 44 40 110 108 74 75	37 34 29 65 47 21	30 27 63 100 115 110 63	24 30 27 61 99 110 110	6 20 20 53 63 55 23	18 13 24 115 58 114 82	18 18 13 24 115 43 114 81	9 5 6 86 26 85 59
1954 1955 1956 1957 1958 1959 1960 1961	40 17 45 27 51 100 169 108	10 39 17 45 27 51 100 168 107	38 12 36 11 27 57 147 82	14 37 21 24 159 103 114 155	35 14 36 21 24 159 101 111 155	10 21 21 21 83 39 67 142	27 35 29 64 96 85 142 153	28 26 35 29 64 93 81 142 151	22 6 21 38 44 42 94 141	46 45 41 112 113 74 75 128	18 43 44 40 110 108 74 75 127	37 34 29 65 47 21 46	30 27 63 100 115 110 63 197	24 30 27 61 99 110 110 63 197	6 20 20 53 63 55 23	18 13 24 115 58 114 82 135	18 13 24 115 43 114 81	9 5 6 86 26 85 59 118
1954 1955 1956 1957 1958 1959 1960 1961 1962	40 17 45 27 51 100 169 108 213	10 39 17 45 27 51 100 168 107 212	38 12 36 11 27 57 147 82 193	14 37 21 24 159 103 114 155 168	35 14 36 21 24 159 101 111 155 168	10 21 21 21 83 39 67 142 159	27 35 29 64 96 85 142 153	28 26 35 29 64 93 81 142 151	22 6 21 38 44 42 94 141 75	46 45 41 112 113 74 75 128 129	18 43 44 40 110 108 74 75 127	37 34 29 65 47 21 46 80	30 27 63 100 115 110 63 197 173	24 30 27 61 99 110 110 63 197 172	6 20 53 63 55 23 192	18 24 115 58 114 82 135 91	18 13 24 115 43 114 81 133 88	9 5 6 86 26 85 59 118 79
1954 1955 1956 1957 1958 1959 1960 1961 1962 1963	40 17 45 27 51 100 169 108 213 120	10 39 17 45 27 51 100 168 107 212	38 12 36 11 27 57 147 821 193	14 37 21 24 159 103 114 155 168 70	35 14 36 21 24 159 101 111 155 168 70	10 21 21 21 83 39 67 142 159	27 35 29 64 96 85 142 153 81	28 26 35 29 64 93 81 142 151 81	22 6 21 38 44 42 94 141 75 101	46 45 41 112 113 74 75 128 129 70	18 43 44 40 110 108 74 75 127 125	37 34 29 65 47 21 46 80 125 70	30 27 63 100 115 110 63 197 173 61	24 30 27 61 99 110 110 63 197 172 61	6 20 20 53 63 55 23 192 152	18 13 24 115 58 114 82 135 91 56	18 18 13 24 115 43 114 81 133 88 56	9 5 6 86 26 85 59 118 79 53
1954 1955 1956 1957 1958 1959 1960 1961 1962	40 17 45 27 51 100 169 108 213	10 39 17 45 27 51 100 168 107 212	38 12 36 11 27 57 147 82 193 120 87	14 37 21 24 159 103 114 155 168	35 14 36 21 24 159 101 111 155 168	10 21 21 21 83 39 67 142 159	27 35 29 64 96 85 142 153 81 110 94	28 26 35 29 64 93 81 142 151	22 6 21 38 44 42 94 141 75 101	46 45 41 112 113 74 75 128 129 70 129	18 43 44 40 110 108 74 75 127	37 34 29 65 47 21 46 80 125 70 121	30 27 63 100 115 110 63 197 173 61 62	24 30 27 61 99 110 110 63 197 172	6 20 20 53 63 55 23 192 152	18 13 24 115 58 114 82 135 91 56 105	18 13 24 115 43 114 81 133 88	9 5 6 86 26 85 59 118 79
1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964	40 17 45 27 51 100 169 108 213 120 90	10 39 17 45 27 51 100 168 107 212 120 88	38 12 36 11 27 57 147 82 193 120 87 92	14 37 21 24 159 103 114 155 168 70 71 119	35 14 36 21 24 159 101 111 155 168 70 65	10 21 21 21 83 39 67 142 159 70 64 115	27 35 29 64 96 85 142 153 81 110 94 99	28 26 35 29 64 93 81 142 151 81 110 94	22 6 21 38 44 42 94 141 75 101 88	46 45 41 112 113 74 75 128 129 70 129 67	18 43 44 40 110 108 74 75 127 125 70 127	37 34 29 65 47 21 46 80 125 70 121 67	30 27 63 100 115 110 63 197 173 61 62 177	24 30 27 61 99 110 63 197 172 61 61	6 20 20 53 63 55 23 192 152 58 58 176	18 13 24 115 58 114 82 135 91 56 105	18 18 13 24 115 43 114 81 133 88 56	9 5 6 86 26 85 59 118 79 53 102
1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965	40 17 45 27 51 100 169 108 213 120 90	10 39 17 45 27 51 100 168 107 212 120 88 92	38 12 36 11 27 57 147 82 193 120 87 92 112	14 37 21 24 159 103 114 155 168 70 71 119	35 14 36 21 24 159 101 155 168 70 65 117	10 21 21 21 83 39 67 142 159 70 64	27 35 29 64 96 85 142 153 81 110 94 99 185	28 26 35 29 64 93 81 142 151 81 110 94 99	22 6 21 38 44 42 94 141 75 101 88 98 182	46 45 41 112 113 74 75 128 129 70 129 67	18 43 44 40 110 108 74 75 127 125 70 127 67	37 34 29 65 47 21 46 80 125 70 121	30 27 63 100 115 110 63 197 173 61 62 177 89	24 30 27 61 99 110 63 197 172 61 61 176	6 20 20 53 63 55 23 192 152 58 58 176	18 13 24 115 58 114 82 135 91 56 105 111 123	18 13 24 115 43 114 81 133 88 56 104 111	9 5 6 86 26 85 59 118 79 53 102 106
1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966	40 17 45 27 51 100 169 108 213 120 90 92 116	10 39 17 45 27 51 100 168 107 212 120 88 92 112	38 12 36 11 27 57 147 82 193 120 87 92 112	14 37 21 24 159 103 114 155 168 70 71 119 122 67	35 14 36 21 24 159 101 111 155 168 70 65 117	10 21 21 21 83 39 67 142 159 70 64 115 118	27 35 29 64 96 85 142 153 81 110 94 99 185 84	28 26 35 29 64 93 81 142 151 81 110 94 99 182	22 6 21 38 44 42 94 141 75 101 88 98 182 84	46 45 41 112 113 74 75 128 129 70 129 67 131 76	18 43 44 40 110 108 74 75 127 125 70 127 67 125	37 34 29 65 47 21 46 80 125 70 121 67 125	30 27 63 100 115 110 63 197 173 61 62 177 89 73	24 30 27 61 99 110 63 197 172 61 176 89	6 20 20 53 63 55 23 192 152 58 176 88	18 13 24 115 58 114 82 135 91 56 105 111 123 99	18 18 13 24 115 43 114 81 133 88 56 104 111 123	9 5 6 86 26 85 59 118 79 53 102 106 123 97 65
1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966	40 17 45 27 51 100 169 108 213 120 90 92 116 89	10 39 17 45 27 51 100 168 107 212 120 88 92 112 87	38 12 36 11 27 147 82 193 120 87 92 112 87	14 37 21 24 159 103 114 155 168 70 71 119 122 67 82	35 14 36 21 24 159 101 111 155 168 70 65 117 118	10 21 21 21 83 39 67 142 159 70 64 115 118 67	27 35 29 64 95 142 153 81 99 185 84 59	28 26 35 29 64 93 81 142 151 81 110 94 99 182 84	22 6 21 38 44 42 94 141 75 101 88 98 182 84 56	46 45 41 112 113 74 75 128 129 70 129 67 131 76	18 43 44 40 110 108 74 75 127 125 70 127 67 125 71	37 34 29 65 47 21 46 80 125 70 121 67 125 71 108	30 27 63 100 115 110 63 197 173 61 62 177 89 73	24 30 27 61 99 110 63 197 172 61 176 89 73	6 20 20 53 63 55 192 152 158 176 88 73	18 13 24 115 58 114 82 135 91 56 105 111 123 99 66	18 18 13 24 115 43 114 81 133 88 56 104 111 123 97	9 5 6 86 26 85 59 118 79 53 102 106 123 97
1954 1955 1956 1957 1959 1960 1961 1962 1963 1964 1966 1966 1967	40 17 45 27 51 100 169 108 213 120 90 116 89 58 70 75	10 39 17 45 27 51 100 168 107 212 120 88 92 112 87 58	38 12 36 11 27 147 82 193 120 87 92 112 87 58	14 37 21 24 159 103 114 155 168 70 71 119 122 67 82 86	35 14 36 21 24 159 101 111 155 168 70 65 117 118 67 81	10 21 21 21 83 39 67 142 159 70 64 115 118 67 81	27 35 29 64 96 85 142 153 81 110 94 99 185 84 59 108	28 26 35 29 64 93 142 151 110 99 182 89 97 90	22 6 21 38 44 42 94 141 75 101 88 98 182 84 56 92 90	46 45 41 112 113 74 75 128 129 70 129 67 131 76 111 102 50	18 43 44 40 110 108 74 75 127 125 70 125 71 109 102 50	37 34 29 65 47 21 46 80 125 70 121 125 71 108 97 50	30 27 63 100 115 110 63 197 173 61 277 89 73 118 137 127	24 30 27 61 99 110 63 197 172 61 176 89 73 118 137 125	6 20 20 53 63 55 23 192 152 58 176 88 73 118 127	18 13 24 115 58 114 82 135 91 56 105 111 123 99 66 101 68	18 18 13 24 115 43 114 81 133 85 104 111 123 97 65 101 68	9 56 86 26 85 59 118 79 106 123 96 67
1954 1955 1956 1957 1959 1960 1961 1962 1963 1964 1965 1966 1966 1968	40 17 45 27 51 100 169 108 213 120 90 92 116 89 58 70	10 39 17 45 27 51 100 168 107 2120 88 92 112 87 58 70	38 12 36 11 27 57 147 82 193 120 87 92 112 87 58 70	14 37 21 24 159 103 114 155 168 70 71 119 122 67 82 86 66	35 14 36 21 249 101 155 168 705 117 187 81 84 65 58	10 21 21 21 83 39 67 142 159 70 64 115 118 67 81 81	27 35 29 64 96 85 142 153 81 110 94 99 185 84 59	28 26 35 29 64 93 81 142 151 81 110 94 99 182 84 59	22 6 21 38 44 42 94 141 75 101 88 98 182 84 56 92	46 45 41 112 113 74 75 128 129 70 129 67 131 76 111 102	18 43 44 40 110 108 74 75 127 125 70 125 71 109 102	37 34 29 65 47 21 46 80 125 70 121 67 125 71 108 97	30 27 63 100 115 110 63 197 173 61 277 89 73 118 137 127	24 30 27 61 99 110 63 197 172 61 176 89 118 1137 125 78	6 20 20 53 63 55 23 192 152 58 176 88 73 118 127 124 78	18 13 24 115 58 114 82 135 91 56 101 123 99 66 101 68 34	18 13 24 115 1143 133 88 56 104 112 97 65 106 31	9 5 6 86 26 85 59 118 79 53 102 106 123 97 65 96
1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971	40 17 457 51 1009 1098 2130 922 1168 898 775 4335	10 39 17 457 500 1687 2120 892 127 58 77 43 32	38 12 36 11 27 147 147 120 87 92 112 87 58 70 74 42 30	14 37 21 24 159 103 114 155 168 70 71 119 122 67 86 66 58 60	35 14 36 21 24 159 1011 155 87 67 118 67 118 65 84 65 88	10 21 21 21 83 39 142 159 10 64 115 118 67 81 81 65 54 54	27 35 29 64 96 85 142 153 81 99 188 99 108 108 108 108 108 108 108 108 108 108	28 26 35 29 64 31 12 11 11 11 11 11 11 11 11 11 11 11 11	22 6 21 38 44 42 94 141 75 101 88 98 182 98 92 90 23 29	46 45 41 112 113 74 75 128 129 70 129 67 131 102 50 51 81	18 43 44 40 10 108 74 127 125 70 127 125 71 109 109 174	37 34 29 65 47 21 46 80 125 70 121 108 17 108 97 17 47	30 27 63 100 115 1163 197 173 61 62 177 89 73 118 137 127 78 31	24 30 27 61 99 110 63 197 176 89 118 1125 78 28	6 20 20 53 63 55 23 192 152 58 176 88 178 118 127 124 78 26	18 13 24 115 58 114 82 135 91 56 105 111 123 99 66 101 68 34 51	18 18 13 24 115 43 18 18 18 104 112 123 65 104 111 123 65 106 115 106 106 107 107 108 108 108 108 108 108 108 108 108 108	9 56 86 26 85 9 11 9 10 10 10 10 10 10 10 10 10 10 10 10 10
1954 1955 1955 1957 1958 1959 1961 1962 1963 1965 1966 1967 1968 1969 1970 1971 1972	40 17 45 27 500 108 213 1200 902 1189 58 70 753 81	10 39 17 457 500 168 107 212 882 127 57 743 375	38 12 36 11 27 147 147 192 120 87 92 112 87 120 74 42 30 74	14 37 21 24 159 103 114 1558 70 71 119 122 82 66 58 60 105	35 14 36 21 24 159 101 1155 168 70 65 117 118 67 81 84 58 58 92	10 21 21 21 83 67 142 159 70 115 115 115 115 81 84 65 54 88	27 35 29 64 96 84 13 11 99 18 19 19 19 19 19 19 19 19 19 19 19 19 19	28 26 25 29 43 14 15 11 19 18 19 18 19 18 19 19 18 19 19 19 19 19 19 19 19 19 19 19 19 19	22 6 21 38 44 42 94 141 101 88 98 182 84 56 92 23 29 82	46 45 41 112 113 74 75 128 129 70 129 67 131 76 111 102 50 51 81 55	18 43 44 40 1108 74 75 127 125 727 125 71 109 102 51 74 54	37 34 29 65 47 21 46 80 125 70 121 67 125 71 108 97 50 47 74 50	30 27 63 100 115 1163 197 173 61 62 177 89 73 118 127 78 31	24 30 27 61 910 197 172 61 176 89 73 118 137 728 98	6 20 20 53 63 55 192 152 176 88 176 124 124 124 124 98	18 13 24 115 58 114 135 135 105 111 123 99 601 68 34 51 71	18 13 24 1143 133 886 1011 123 65 1018 35 171	9 56 86 26 85 9 11 9 10 10 10 10 10 10 10 10 10 10 10 10 10
1954 1955 1955 1957 1958 1959 1961 1963 1964 1965 1966 1967 1968 1969 1971 1972 1973	40 17 45 27 510 109 108 213 120 916 916 958 77 43 58 102	10 39 17 457 100 168 107 2120 88 92 1127 57 43 77 43 75 101	38 12 36 11 27 147 82 193 120 87 120 87 120 74 42 30 74 101	144 155 168 119 119 122 67 82 86 66 58 60 105 90	35 14 36 21 25 101 111 155 168 70 65 118 67 81 84 65 58 92	10 21 21 21 83 39 67 142 159 70 15 115 115 184 65 54 54 88 89	27 35 29 64 96 85 142 153 110 94 99 185 84 59 108 91 28 89 67	28 26 35 29 64 93 81 142 151 81 110 94 99 182 84 59 97 90 28 84 66	22 6 21 38 44 42 141 75 101 88 182 90 23 290 23 296 66	46 45 41 112 113 74 75 128 129 67 131 76 111 102 50 51 55 53	18 43 44 40 110 108 74 75 127 125 70 125 71 109 102 50 51 54 54 52	37 34 29 65 47 21 46 80 125 70 121 125 71 108 97 108 97 174 150 50	30 27 63 100 1150 197 173 61 61 77 87 118 137 7 127 7 81 100 78	24 30 27 61 99 110 63 197 172 61 61 61 68 73 118 137 125 78 98 78	6 20 20 53 63 55 23 192 152 158 176 88 73 118 127 124 78 26 97	18 13 24 125 58 114 82 135 56 105 111 123 99 66 101 68 34 44	18 18 13 24 115 43 114 81 133 88 56 104 1123 97 65 101 68 31 71 44	9 56 82 85 9 11 8 50 10 10 10 10 10 10 10 10 10 10 10 10 10
1954 1955 1955 1957 1958 1959 1961 1962 1964 1965 1966 1967 1971 1972 1973 1973 1974	40 17 45 27 100 169 213 1290 92 116 89 75 43 35 120 67	10 39 17 45 27 51 100 168 92 112 88 92 112 87 70 74 43 32 75 101 66	38 12 36 11 27 57 147 82 193 120 87 92 112 112 70 74 42 30 10 10 11 65	14 37 21 24 159 103 114 155 168 70 71 119 122 86 66 66 58 60 50 53	35 14 36 24 159 101 115 155 165 117 118 67 81 65 58 58 92 48	10 21 21 83 67 142 159 70 64 115 118 67 81 81 85 54 88 89 87	27 35 29 64 96 84 153 81 194 99 108 91 28 89 108 91 28 67 70	28 26 35 29 49 81 142 151 81 110 94 99 182 84 97 90 28 32 84 66 68	22 6 21 38 44 42 141 75 101 88 98 182 192 90 23 29 29 86 66 68	46 45 41 112 113 75 128 129 70 129 67 131 76 111 102 50 51 85 53 70	18 43 44 40 110 108 74 75 127 67 125 71 109 50 51 74 52 65	37 344 29 65 47 21 46 80 125 70 121 67 17 1,08 97 50 47 74 50 60 60	30 27 63 100 115 63 197 173 61 62 177 78 89 73 118 137 127 78 31	24 30 27 61 99 110 63 197 172 61 61 176 89 71 125 78 28 98 68	6 20 20 53 63 55 52 3 192 152 58 58 176 78 27 124 78 26 77 67 67	18 13 24 115 56 105 111 129 66 101 68 34 44 88	18 18 13 12 14 81 133 88 56 104 111 123 97 65 101 68 31 51 44 88	956666598 11750637566708 100296567048
1954 1955 1955 1957 1958 1959 1960 1961 1963 1964 1966 1966 1967 1970 1971 1972 1973 1975	40 17 457 51 1009 101 101 101 101 101 101 101 101 1	10 39 17 45 27 51 100 168 122 120 88 92 218 70 43 32 75 101 66 74	38 12 36 11 27 57 147 82 193 120 87 92 112 87 74 42 30 74 101 101 101 72	144 1259 103 114 155 168 70 71 119 122 67 82 66 58 60 105 90 90 90 90 90 90 90 90 90 90 90 90 90	35 14 36 21 24 159 101 115 155 167 81 867 81 865 58 92 89 89 84 821	10 21 21 21 21 21 21 33 39 67 142 159 170 115 118 67 81 84 54 15 54 18 89 89 18	27 35 29 64 85 1453 81 110 99 185 49 194 59 198 32 87 70 88	28 26 35 29 64 49 151 110 94 99 182 84 59 90 28 32 86 668 87	22 6 21 38 44 42 94 141 75 101 101 88 98 182 84 56 92 1 23 29 66 66 66 66 86	46 45 41 112 113 75 128 129 70 129 67 131 102 50 51 81 55 70 76	18 43 44 40 110 108 74 75 71 125 70 127 625 71 109 102 51 74 54 55 76	37 344 29 65 47 21 46 80 125 71 125 71 108 97 71 47 74 50 60 73	30 27 63 100 63 197 173 61 62 177 89 73 118 137 78 31 100 78 31 46	24 30 27 61 99 110 63 197 172 61 176 89 73 118 125 78 28 98 68 44	6 20 20 53 363 63 55 23 192 152 88 73 118 1124 178 26 98 177 144 1	18 13 124 125 125 125 125 125 125 125 125 125 125	18 18 13 24 115 43 114 81 133 88 55 60 104 111 123 97 65 105 68 31 51 71 44 88 57	9 5 6 8 6 8 5 9 1 1 8 5 9 1 1 2 3 9 6 7 9 1 1 0 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6 7 6
1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1971 1971 1972 1973 1974 1975 1977	40 17 45 27 51 100 169 90 92 116 89 58 70 75 81 102 67 74 55	10 39 17 45 27 51 107 212 212 120 88 92 112 87 74 43 32 75 101 66 67 45 54	38 12 36 11 27 57 147 82 120 87 92 112 112 120 87 92 112 112 130 74 101 65 165 72 73	144 137 214 1259 103 1114 1155 168 70 71 119 122 67 82 86 66 58 60 105 90 53 21 55	35 14 36 21 24 159 101 115 168 70 65 117 81 84 65 88 92 89 48 48 51	10 21 21 21 83 39 67 142 159 147 118 118 84 65 54 47 47 47 15 88 88 88 89 47	27 35 29 64 85 115 81 119 99 109 109 109 109 109 109 109 109	28 26 35 29 81 142 151 110 94 99 182 84 66 87 70	22 6 21 38 44 42 94 141 75 101 88 88 98 182 92 84 92 92 82 66 68 68 68	46 45 41 112 113 75 128 129 70 107 107 107 107 107 107 107 107 107	18 43 44 40 110 108 74 72 125 70 127 67 71 109 109 109 51 74 52 65 76 76 71	37 34 29 65 47 21 46 87 125 70 121 108 97 150 47 74 50 60 100 100 100 100 100 100 100 100 100	30 27 63 197 100 63 197 73 118 137 127 8 31 100 78 8 46 183	24 30 27 61 99 110 63 117 61 176 61 177 125 73 118 137 75 28 98 78 64 44 166	6 20 20 53 63 55 23 192 152 58 176 88 73 118 127 1 128 126 167 67 67 67 67 67 67 67 67 67 67 67 67 6	18 13 124 1215 135 114 182 135 156 101 123 99 66 106 34 51 71 44 88 86 67	18 18 13 24 115 43 114 81 133 88 56 104 111 297 65 101 88 51 71 44 88 57 59	9 5 6 6 26 85 9 118 9 5 2 106 3 7 6 5 6 6 7 0 44 8 8 8 7 5 9
1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1966 1967 1971 1972 1973 1974 1975 1976 1977	40 17 45 27 51 100 169 90 92 116 89 58 75 43 35 81 102 67 74 53 73	10 39 17 45 27 51 100 88 89 21 120 87 70 74 43 32 75 101 66 74 54 33	38 12 36 11 27 57 147 82 193 193 112 87 92 112 87 74 42 13 74 101 65 72 13 30 13 30	144 155 168 71 119 122 67 82 86 66 58 90 53 21 55 55	35 14 36 21 24 159 101 115 158 70 65 117 118 84 65 58 89 48 21 51	10 21 21 21 83 399 70 64 115 115 115 118 67 81 84 88 88 88 88 89 47 18 18 15 50	27 35 29 646 85 1453 810 99 185 423 810 99 185 849 108 87 708 87 73	28 26 35 64 93 142 151 81 110 99 182 84 59 90 28 32 66 68 87 70 72	22 6 21 38 4 4 42 94 141 7 101 88 98 182 90 23 90 23 66 68 68 66 68 67	46 45 41 112 113 75 128 129 70 129 70 131 76 111 105 51 81 55 70 67 67 110 67 110 67 110 67 110 67 110 67 110 67 110 67 110 67 67 67 67 67 67 67 67 67 67 67 67 67	18 43 44 40 110 108 74 75 127 125 70 125 71 109 50 51 74 52 65 76 76 76 71	37 34 29 65 47 21 46 80 125 70 125 67 125 125 70 125 50 50 47 47 47 50 50 60 70 47 44 44 44 49 49	30 27 63 100 115 110 63 197 73 118 137 127 78 31 100 78 64 48 183 99	24 30 27 61 99 110 63 197 172 61 61 176 89 73 113 125 78 28 78 68 44 66 79	6 20 20 53 63 55 23 192 152 152 176 88 176 78 124 178 177 167 164 164 176 176 176 176 176 176 176 176 176 176	18 13 13 15 58 114 82 135 91 66 105 111 123 996 61 101 44 88 8 67 87	18 18 24 115 43 18 18 56 101 65 101 68 31 51 44 88 57 44 88 57 59 87	9 5 6 6 8 5 9 1 1 8 9 5 1 1 2 3 7 9 5 5 6 6 7 3 4 8 8 7 9 8 5 7 8 5
1954 1955 1955 1957 1959 1960 1962 1963 1964 1965 1966 1967 1971 1972 1973 1974 1975 1977 1977	40 17 45 27 51 100 169 90 90 95 89 58 70 75 43 35 81 102 67 74 55 80	10 39 17 45 27 51 100 168 107 212 212 212 112 88 92 112 75 106 74 43 32 75 106 74 54 54 75	38 12 36 11 27 57 147 192 193 120 87 922 187 70 44 42 30 74 44 101 101 53 30 74 30 74 65 63 63	144 1259 103 114 155 168 71 119 122 67 82 86 66 58 60 53 21 55 55 117	35 14 36 21 24 159 101 115 155 168 67 81 865 58 92 48 21 51 108	10 21 21 21 83 399 677 142 1159 70 64 1159 677 81 84 54 54 88 88 88 88 88 85 18 50 67 99 99 99 99 99 99 99 99 99 99 99 99 99	27 35 29 646 85 1453 810 99 185 85 194 99 185 194 99 185 194 99 185 194 195 195 195 195 195 195 195 195 195 195	28 26 35 29 44 93 81 1151 110 94 99 182 84 59 97 70 28 87 70 72	22 6 21 38 44 42 94 11 101 88 182 182 182 192 182 183 29 86 66 68 66 67 82	46 45 41 1113 74 75 128 129 67 131 67 110 50 110 50 110 50 110 76 110 76 110 76 110 76 76 110 76 76 110 76 76 76 76 76 76 76 76 76 76 76 76 76	18 43 44 40 110 108 75 127 67 125 50 127 67 125 50 109 102 51 74 54 55 76 104 49 77	37 34 29 65 47 21 46 80 80 125 70 125 71 108 97 74 50 50 60 73 104 11 49 49 49 49 49 49 49 49 49 49 49 49 49	30 27 63 100 115 110 63 117 61 62 177 73 118 137 77 78 31 100 68 46 183 77	24 30 27 99 110 61 197 172 61 676 89 73 118 125 78 28 98 44 44 166 77 75	6 20 20 53 63 55 58 192 152 58 73 118 124 178 26 98 176 163 163 163 163 163 163 163 163 163 16	18 13 12 12 15 15 18 12 13 15 15 11 14 18 12 13 15 11 12 13 15 16 16 16 16 16 16 16 16 16 16 16 16 16	18 18 24 115 43 114 81 1123 97 65 101 1123 97 65 1068 31 57 74 88 57 58 73 58	9 5 6 6 6 2 6 8 5 9 1 1 8 9 5 7 5 3 2 6 6 6 7 0 4 8 8 5 7 9 5 5 5 5 5 5 5 5 6 6 7 0 4 8 8 5 7 9 5 5 6 6 6 7 0 4 8 8 5 7 9 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1966 1967 1971 1971 1973 1974 1977 1978 1978 1978	40 17 455 27 51 100 108 213 120 90 92 116 89 75 43 35 81 102 67 74 55 37 80 281	10 39 17 45 27 50 100 168 88 91 21 20 88 91 21 87 74 43 32 75 101 66 64 54 33 75 23 33	38 12 36 11 27 57 147 183 120 87 92 112 112 130 74 101 553 301 631 301 631 531	144 371 244 155 103 114 155 70 71 119 267 82 86 66 65 60 65 55 55 55 55 55 55 55	35 14 36 21 24 159 111 155 168 70 65 117 118 67 118 84 65 58 92 89 48 151 51 51 51 51 81 81 81 81 81 81 81 81 81 81 81 81 81	10 21 21 83 399 67 142 159 70 16 67 18 84 65 54 47 88 89 47 17 50 90 90	27 35 29 496 85 21 11 11 11 11 11 11 11 11 11 11 11 11	28 26 35 64 93 84 151 81 110 94 99 182 84 66 87 70 70 70 131	22 6 21 38 44 42 94 11 141 1 88 18 98 1 182 1 90 1 29 1 82 1 66 1 68 1 67 1 82 1	46 45 41 1113 74 75 128 170 127 131 102 55 1102 55 1102 55 106 106 106 106 106 106 106 106 106 106	18 43 44 40 10 108 74 75 127 67 125 70 102 50 51 54 52 67 67 104 49 77 118	37 34 29 65 47 21 46 80 125 70 125 71 125 71 50 47 47 50 60 61 50 60 61 61 61 61 61 61 61 61 61 61 61 61 61	30 27 63 100 115 110 61 67 73 89 73 113 7127 78 84 64 183 99 78 80	24 30 27 61 99 110 197 172 61 176 89 71 125 78 98 78 64 44 166 79 77	6 20 20 53 63 55 23 192 152 58 176 18 127 1124 1 77 114 163 176 159 161 161 161	18 13 13 15 58 114 82 125 56 105 111 123 99 666 101 684 551 771 488 58 67 87 70	18 18 12 24 115 43 18 18 11 123 97 65 101 68 31 171 44 88 87 59 87 59 87 59 87 59 87 59 87 59 87 59 87 59 87 59 87 59 87 59 87 59 59 59 59 59 59 59 59 59 59 59 59 59	95666659895129532975308670448879585647
1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1966 1967 1971 1972 1973 1975 1976 1976 1976 1977 1978 1978 1978	40 17 45 27 51 100 90 92 116 87 70 75 81 102 67 74 537 80 281 169	10 39 17 45 27 51 100 168 107 212 120 88 92 112 58 70 43 32 74 43 32 75 101 66 67 44 43 32 75 101 66 66 43 45 45 45 45 45 45 45 45 45 45 45 45 45	38 12 366 11 27 57 147 193 120 87 120 87 72 112 87 74 42 30 74 101 65 72 13 30 63 15 73 74 74 75 75 77 77 77 77 77 77 77 77 77 77 77	14 37 21 24 1559 103 1155 168 70 719 122 67 82 66 58 66 55 55 55 117 2174 74 74 74 74 74 74 74	35 14 36 21 24 24 159 111 155 67 118 67 118 65 58 89 48 25 108 21 21 21 21 21 21 21 21 21 21 21 21 21	10 21 21 83 39 167 142 159 115 118 65 54 88 88 18 84 18 54 18 18 50 90 90 90 90 90 90 90 90 90 90 90 90 90	27 35 294 96 85 11 81 11 94 91 83 11 83 11 19 19 19 19 10 10 11 11 11 11 11 11 11 11 11 11 11	28 26 329 64 93 142 151 810 94 99 97 28 84 59 99 28 87 72 103 111	22 6 21 38 44 42 90 101 88 182 84 90 23 29 66 68 86 67 82 94 94	46 45 41 113 77 128 129 67 131 102 50 1102 50 1102 50 1102 50 1102 70 1102 70 1102 70 1102 70 1102 70 1102 70 70 70 70 70 70 70 70 70 70 70 70 70	18 43 44 40 110 108 75 75 127 67 71 109 102 50 51 74 52 65 76 71 118	37 34 29 65 47 21 46 80 125 70 125 71 108 97 50 50 67 74 14 91 50 50 67 13 14 97 97 97 97 97 97 97 97 97 97 97 97 97	30 27 63 100 115 110 63 197 173 61 62 177 89 73 1137 127 78 310 78 64 483 99 77 78 183 77 78 197 78 197 78 197 78 197 78 197 78 197 78 197 78 197 197 197 197 197 197 197 197 197 197	24 30 27 61 99 110 163 197 172 61 61 176 873 118 118 125 78 28 98 44 466 77 75 75 75 75	6 20 20 53 63 55 55 22 152 152 188 73 1187 127 124 163 76 159 164 142 142 142 142 142 142 142 142 142 14	18 12 12 15 15 18 18 18 18 18 18 18 18 18 18 18 18 18	18 18 12 24 115 43 188 18 56 104 111 123 7 65 104 88 57 9 87 35 66 147	9 5 6 6 6 6 2 6 5 9 1 7 9 3 2 1 1 0 2 6 5 6 7 3 0 8 5 7 9 8 5 6 7 3 0 8 8 5 7 9 8 5 6 7 1 2 7 1
1954 1955 1955 1957 1959 1960 1961 1962 1963 1964 1965 1966 1971 1972 1973 1974 1975 1976 1977 1978 1978 1978 1978 1978 1978 1978	40 17 45 27 51 1000 92 116 89 92 116 89 70 75 81 102 67 74 55 81 102 89 89	10 39 17 45 27 50 100 168 92 112 87 70 74 43 27 51 101 66 74 43 27 75 101 66 74 43 23 31 61 75 75 75 75 75 75 75 75 75 75 75 75 75	38 12 366 11 27 57 147 120 87 92 112 87 92 112 87 41 101 101 53 74 101 53 75 76 78 78 78 78 78 78 78 78 78 78 78 78 78	14 37 21 24 155 168 70 71 112 67 82 66 58 60 105 55 117 207 74 78	35 14 36 21 24 159 111 155 168 65 117 118 84 658 89 89 89 89 81 81 81 81 81 81 81 81 81 81 81 81 81	10 21 21 83 39 70 142 159 70 142 159 115 118 67 18 4 65 18 84 18 88 18 89 18 18 50 90 90 90 90 90 90 90 90 90 90 90 90 90	27 35 29 96 96 85 11 11 99 18 50 81 11 82 11 11 11 11 11 11 11 11 11 11 11 11 11	28 26 35 29 64 93 84 151 81 194 99 91 82 59 97 92 83 84 77 99 131 162	22 6 21 38 44 42 75 101 82 98 182 990 22 90 82 66 68 68 68 68 92 92 92 92 92 94 92 94 92 95 95	46 45 412 113 74 75 129 709 1376 111 209 111 209 111 209 111 209 76 76 76 76 76 76 76 76 76 76 76 76 76	18 434 40 110 108 74 75 70 127 71 125 71 102 50 51 44 97 118 110 110 110 110 110 110 110 110 110	37 34 29 65 47 21 125 70 125 71 108 97 108 97 108 104 109 73 104 109 73 89 109 73 89 89 80 80 80 80 80 80 80 80 80 80 80 80 80	30 27 63 100 115 117 89 73 118 137 77 83 1100 68 46 183 99 77 80 174 132	24 30 27 61 99 110 163 197 172 61 61 176 89 118 137 125 898 74 167 75 74 124	6 20 20 20 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 32 31 31 31 31 31 31 31 31 31 31 31 31 31	18 13 12 15 58 114 123 56 105 1123 999 66 106 107 123 999 66 107 123 999 66 107 123 999 66 107 107 107 107 107 107 107 107 107 107	18 18 12 43 115 43 181 133 88 65 104 111 123 65 101 68 57 71 44 48 57 59 65 66 67 67 67 67 67 67 67 67 67 67 67 67	95666685989310633795667048857951102379566704885795555555555555555555555555555555555
1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1966 1967 1971 1972 1973 1975 1976 1976 1976 1977 1978 1978 1978	40 17 45 27 51 1000 92 116 89 92 116 89 70 75 81 102 281 102 281 103 281 178	10 39 17 45 27 51 100 168 107 212 120 88 92 112 58 70 43 32 74 43 32 75 101 66 67 44 43 32 75 101 66 66 43 45 45 45 45 45 45 45 45 45 45 45 45 45	38 12 366 11 27 57 147 120 87 92 112 87 92 112 87 41 101 101 53 74 101 53 75 76 78 78 78 78 78 78 78 78 78 78 78 78 78	14 37 21 24 155 168 70 70 70 70 70 70 70 7	35 14 36 21 24 24 159 111 155 67 118 67 118 65 58 89 48 25 108 21 21 21 21 21 21 21 21 21 21 21 21 21	10 21 21 83 39 167 142 159 115 118 65 54 88 88 18 84 18 54 18 18 50 90 90 90 90 90 90 90 90 90 90 90 90 90	27 35 294 96 85 11 81 11 94 91 83 11 83 11 19 19 19 19 10 10 11 11 11 11 11 11 11 11 11 11 11	28 26 329 64 93 142 151 810 94 99 97 28 84 59 99 28 87 72 103 111	22 6 21 38 44 42 90 101 88 182 84 90 23 29 66 68 86 67 82 94 94	46 45 412 113 74 75 129 709 1376 111 209 111 209 111 209 111 209 709 111 209 709 111 209 709 111 209 709 709 709 709 709 709 709 709 709 7	18 43 44 40 110 108 75 75 127 67 71 109 102 50 51 74 52 65 76 71 118	37 34 29 65 47 21 46 80 125 70 125 71 108 97 50 50 67 74 14 91 50 50 67 13 14 97 97 97 97 97 97 97 97 97 97 97 97 97	30 27 63 100 115 110 63 197 173 61 62 177 89 73 1137 127 78 310 78 64 483 99 77 78 183 77 78 197 78 197 78 197 78 197 78 197 78 197 78 197 78 197 197 197 197 197 197 197 197 197 197	24 30 27 61 99 110 163 197 172 61 61 176 873 118 118 125 78 28 98 44 466 77 75 75 75 75	6 20 20 53 63 55 55 22 152 152 188 73 1187 127 124 163 76 159 164 142 142 142 142 142 142 142 142 142 14	18 12 12 15 15 18 18 18 18 18 18 18 18 18 18 18 18 18	18 18 12 24 115 43 188 18 56 104 111 123 7 65 104 88 57 9 87 35 66 147	9 5 6 6 6 6 2 6 5 9 1 7 9 3 2 1 1 0 2 6 5 6 7 3 0 8 5 7 9 8 5 6 7 3 0 8 8 5 7 9 8 5 6 7 1 2 7 1

Table 2. Sea surface temperature in degrees Calsius. The standard error of the mean appears within parentheses to the right of the mean temperature value.

					War.	7.1.0
1052	Jan	Feb	<u> </u>	ADF 191	<u>May</u> 22.79(.37)	Jun 20.52(.46)
1953	21.14(.50)	23.08(.64)	24.63(.51) 22.01(.42)	24.78(.49) 16.36(.29)	17.86(.23)	16.95(.25)
1954	18.55(.33)	18.50(.52)	21.01(.85)	19.01(.37)	17.89(.85)	16.67(.30)
1955	21.72(.39)	17.64(.82)	21.66(.46)	20.71(.29)	19.90(.41)	19.22(.29)
1956	19.90(.44)	24.83(.48)	25.26(.21)	24.53(.37)	24.76(.48)	23.15(.27)
1957		25.00(.19)	24.52(.25)	22.83(.30)	21.63(.35)	20.42(.18)
1958	23.15(.11) 20.45(.21)	23.08(.18)	24.49(.15)	21.54(.25)	20.90(.18)	19.26(.25)
1959	21.97(.18)	22.74(.18)	22.70(.19)	20.58(.18)	19.09(.14)	18.22(.18)
1960 1961	22.30(.15)	23.24(.20)	21.61(.21)	19.94(.15)	20.24(.21)	18.67(.15)
1962	21.29(.14)	22.12(.18)	20.37(.18)	19.41(.18)	18.68(.18)	18.92(.12)
1963	20.72(.24)	22.67(.17)	22.15(.16)	20.21(.17)	21.01(.13)	18.98(.10)
1964	21.44(.12)	22.41(.14)	20.91(.22)	20.66(.37)	18.38(.26)	17.35(.24)
1965	21.75(.26)	23.09(.27)	23.96(.15)	24.54(.21)	24.08(.20)	22.11(.14)
1966	22.09(.20)	23.62(.20)	21.96(.25)	20.85(.24)	19.88(.24)	18.67(.16)
1967	20.01(.22)	22.12(.22)	21.86(.23)	20.61(.19)	19.11(.24)	18.13(.30)
1968	19.67(.21)	22.21(.21)	21.78(.22)	18.60(.20)	18.49(.30)	17.31(.20)
1969	22.28(.23)	22.36(.23)	24.25(.18)	23.51(.23)	22.94(.25)	20.92(.22)
1970	21.71(.26)	21.94(.43)	22.51(.26)	20.40(.33)	18.73(.21)	16.85(.14)
1971	19.70(.19)	20.34(.29)	19.70(.25)	21.63(.36)	19.80(.32)	18.46(.46)
1972	20.94(.25)	24.38(.41)	25.17(.37)	22.97(.24)	23.05(.22)	21.68(.24)
1973	24.22(.25)	24.40(.39)	22.52(.20)	19.54(.31)	19.16(.37)	17.36(.35)
1974	20.72(.30)	22.00(.36)	22.10(.31)	21.35(.36)	21.36(.24)	19.51(.19)
1975	21.25(.28)	22.41(.24)	23.41(.19)	22.21(.27)	20.81(.21)	18.67(.18)
1976	21.16(.30)	23.38(.64)	22.96(.33)	22.45(.35)	21.64(.28)	21.23(.30)
1977	23.69(.22)	23.46(.19)	22.44(.32)	20.44(.28)	19.77(.24)	19.66(.27)
1978	21.06(.24)	23.46(.25)	22.57(.25)	22.69(.32)	20.07(.34)	19.95(.49)
1979	22.42(.19)	23.11(.28)	23.62(.22)	22.71(.26)	20.37(.31)	20.61(.45)
1980	21.69(.25)	23.22(.21)	24.21(.21)	22.48(.29)	21.81(.17)	20.84(.13)
1981	20.90(.26)	22.80(.22)	22.10(.24)	20.99(.28)	20.73(.20)	19.44(.16)
1982	21.33(.22)	22.62(.30)	21.65(.23)	21.20(.24)	21.01(.22)	21.15(.41)
1983	26.42(.19)	27.38(.19)	27.99(.14)	27.93(.20)	27.72(.15)	25.93(.30)
		46 76/ 361	91 09/ 261	20 05/ 221		10 40 (20)
1984	22.13(.22)	22.78(,29)	21.92(.26)	20.95(.33)	19.17(.31)	19.49(,28)
	Jul	Aug	Sep	0ct	19.17(.31) Nov	_Dec
1953	<i>Jul</i> 19.78(.27)	Aug 19.06(.21)	5ep 18.20(.34)	0ct 18.24(.35)	19.17(.31) Nov 18.72(.40)	Dec 18.81(.41)
1953 1954	<i>Jul</i> 19.78(.27) 14.60(.35)	Aug 19.06(.21) 15.57(.41)	Sep 18.20(.34) 14.91(.31)	0ct 18.24(.35) 14.22(.29)	Nov 18.72(.40) 17.11(.26)	
1953 1954 1955	Jul 19.78(.27) 14.60(.35) 17.68(.53)	19.06(.21) 15.57(.41) 15.54(.45)	Sep 18.20(.34) 14.91(.31) 15.71(.28)	0ct 18.24(.35) 14.22(.29) 14.69(.37)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24)	Dec 18.81(.41) 19.24(.54) 18.12(.37)
1953 1954 1955 1956	Jul 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24)	Aug 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29)	0ct 18.24(.35) 14.22(.29)	Nov 18.72(.40) 17.11(.26)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40)
1953 1954 1955	Jul 19.78(.27) 14.60(.35) 17.68(.53)	19.06(.21) 15.57(.41) 15.54(.45)	Sep 18.20(.34) 14.91(.31) 15.71(.28)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29)	Dec 18.81(.41) 19.24(.54) 18.12(.37)
1953 1954 1955 1956 1957	Jul 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34)	Aug 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19)	005 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20)	19.17(.31) NOV 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16)
1953 1954 1955 1956 1957 1958	Jul 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26)	Aug 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15)	065 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13)	19.17(.31) NOV 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31)
1953 1954 1955 1956 1957 1958 1959	Jul 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15)	Aug 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12)	5ep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11)	005 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15)
1953 1954 1955 1956 1957 1958 1959 1960	Jul 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10)	Aug 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.87(.11)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963	701 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10) 18.04(.22) 17.30(.09) 18.70(.13)	Aug	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.77(.10) 18.00(.11)	Oct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.54(.28)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.72(.17)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964	79.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 19.63 (.26) 17.55 (.15) 17.65 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18)	Aug	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.77(.10) 18.00(.11) 16.11(.14)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.08(.12) 18.54(.28) 18.31(.32)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.72(.17) 19.76(.19)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965	79.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20)	### AUT 19.08(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.22(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.37(.10) 18.00(.11) 16.11(.14) 17.79(.16)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.08(.12) 18.54(.28) 18.31(.32) 18.76(.13)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.39(.17) 19.39(.17) 19.39(.17) 19.72(.17) 19.72(.17) 19.76(.19) 21.49(.15)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966	79.7 19.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 22.43 (.34) 19.63 (.26) 17.55 (.15) 17.55 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12)	AWG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.54(.28) 18.31(.22) 18.76(.13)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20)
1953 1954 1955 1956 1957 1958 1950 1960 1961 1962 1963 1964 1965 1966 1966	79.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 19.63 (.26) 17.55 (.15) 17.65 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12) 17.40 (.16)	Aug 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.62(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17)	18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.87(.11) 16.97(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.24) 18.54(.28) 18.31(.32) 18.13(.17) 18.90(.18)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1963 1964 1965 1966 1967	701 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.64(.23)	Aug 19.06(.21) 15.57(.41) 15.57(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.97(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 15.76(.13) 18.26(.38)	0ct 18.24(.15) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.28) 18.31(.32) 18.76(.13) 18.13(.17) 16.90(.18)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24)
1953 1954 1955 1956 1957 1958 1959 1961 1962 1963 1964 1965 1965 1966 1967	79.7 19.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 22.43 (.34) 19.63 (.26) 17.55 (.15) 17.65 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12) 17.40 (.16) 17.64 (.23) 18.44 (.20)	AWG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.37(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.15(.19)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.33(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.54(.28) 18.31(.32) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1966 1969 1969	79.78 (.27) 14.60 (.35) 17.68 (.53) 18.34 (.24) 22.43 (.34) 19.63 (.26) 17.55 (.15) 17.55 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12) 17.40 (.16) 17.64 (.23) 18.44 (.20) 15.72 (.12)	Aug 19.06(.21) 15.57(.41) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.62(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 16.19(.13)	18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.87(.11) 16.17(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.36(.19) 16.33(.28)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.28) 18.54(.28) 18.31(.32) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21)
1953 1954 1955 1955 1956 1957 1960 1961 1962 1963 1964 1965 1966 1967 1968 1968	701 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10) 18.04(.22) 17.30(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.40(.16) 17.40(.16) 17.40(.16) 17.40(.16) 17.54(.23) 18.44(.20) 18.772(.12) 18.00(.28)	AWG 19.06(.21) 15.57(.41) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.11) 16.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.27(.23)	Seg 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.97(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.36(.19) 16.33(.28) 16.33(.28) 16.32(.26)	0ct 18.24(.15) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.49(.10) 17.55(.16) 16.49(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.05(.27)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.28) 18.31(.32) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.34(.15)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.15(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.55)
1953 1954 1955 1955 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1970	79.78(.27) 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.64(.23) 18.44(.20) 15.72(.12) 18.00(.28) 21.18(.36)	AWG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.27(.23) 21.77(.23)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.37(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.16(.19) 16.33(.28) 16.32(.26) 19.29(.36)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.33(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.05(.27) 19.17(.25)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.54(.28) 18.31(.32) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.34(.15) 20.61(.32)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.81(.35) 21.73(.31)
1953 1954 1955 1955 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971	79.78 (.27) 19.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 22.43 (.34) 19.63 (.26) 17.55 (.15) 17.55 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12) 17.40 (.16) 17.64 (.23) 18.44 (.20) 15.72 (.12) 18.00 (.28) 21.18 (.36) 16.88 (.32)	### AUG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 18.01(.17) 18.01(.17) 18.01(.17) 18.01(.17) 18.01(.17) 18.01(.17) 18.01(.17) 18.01(.17)	18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.15) 16.64(.18) 17.17(.11) 16.87(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.36(.19) 16.33(.28) 16.32(.26) 19.29(.36)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.05(.27) 19.17(.25) 16.11(.31)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.28) 18.54(.28) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.34(.15) 20.61(.32) 17.27(.24)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 19.77(.20)
1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1968 1968 1969 1971 1972 1973	701 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.64(.23) 18.44(.20) 15.72(.12) 18.00(.28) 21.18(.36) 16.88(.32) 18.12(.15)	AUG 19.06(.21) 15.57(.41) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.11) 16.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.27(.23) 21.77(.23) 21.77(.23) 21.74(.15)	Seg 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.15) 17.80(.15) 16.64(.18) 17.17(.11) 16.97(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.16(.19) 16.33(.28) 16.33(.26) 19.29(.36) 15.80(.22) 16.70(.31)	0ct 18.24(.15) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.49(.10) 17.55(.16) 16.49(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.05(.27) 19.17(.25) 16.11(.31) 16.91(.32)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.24) 18.54(.28) 18.31(.32) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.34(.15) 20.61(.32) 17.27(.24)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.76(.19) 21.49(.21) 19.77(.20) 18.22(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.81(.35) 21.73(.31) 19.01(.30)
1953 1954 1955 1955 1957 1958 1959 1960 1961 1963 1964 1965 1966 1967 1969 1970 1970 1971	79.78(.27) 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.15) 17.65(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.64(.23) 18.44(.20) 15.72(.12) 18.00(.28) 21.18(.36) 16.88(.32) 18.12(.15)	AWG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.45(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.27(.23) 21.77(.23) 21.77(.23) 16.04(.16) 17.48(.15) 17.68(.36)	Sep 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.37(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.16(.15) 16.33(.28) 16.32(.26) 19.29(.36) 15.80(.22) 16.70(.31) 15.71(.24)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.79(0.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.37(.25) 16.11(.31) 16.91(.32) 15.59(.20)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.54(.28) 18.31(.32) 18.76(.13) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.39(.13) 17.94(.26) 18.34(.25) 20.61(.32) 17.27(.24)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.81(.35) 21.73(.31) 19.01(.30) 19.83(.35)
1953 1954 1955 1955 1955 1958 1959 1960 1961 1962 1963 1964 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975	79.78 (.27) 19.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 22.43 (.34) 19.63 (.26) 17.55 (.15) 17.55 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12) 17.40 (.16) 17.64 (.23) 18.44 (.20) 15.72 (.12) 18.00 (.28) 21.18 (.36) 16.12 (.15) 18.446 (.25) 21.18 (.20)	Aug 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.42(.23) 21.77(.23) 21.77(.23) 21.748(.15) 17.68(.36)	18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.10) 18.00(.11) 16.37(.10) 18.00(.11) 16.31(.14) 17.79(.16) 16.31(.10) 15.76(.13) 18.26(.38) 17.16(.19) 16.33(.28) 16.32(.26) 19.29(.36) 19.29(.36) 19.29(.36) 19.29(.36)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.39(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.05(.27) 19.17(.25) 16.11(.31) 16.91(.32) 15.59(.20) 19.19(.25)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.28) 18.54(.28) 18.13(.17) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.34(.15) 20.61(.32) 17.27(.24) 18.96(.23)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.74(.24) 21.73(.31) 19.81(.35) 21.73(.31) 19.83(.35) 18.74(.24) 21.46(.15)
1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1966 1967 1971 1972 1973 1974 1975 1977	79.78(.27) 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.64(.23) 18.44(.20) 18.72(.12) 18.00(.28) 21.18(.36) 16.88(.32) 18.12(.15) 18.46(.25)	Aug 19.06(.21) 15.57(.41) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.11) 16.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 18.01(.17) 18.01(.17) 16.19(.13) 17.27(.23) 21.77(.23) 21.77(.23) 21.748(.15) 17.68(.36) 19.51(.55) 17.23(.22)	Seg 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.15) 17.48(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.36(.19) 16.33(.28) 16.32(.26) 19.29(.36) 15.80(.22) 16.70(.31) 15.71(.24) 19.00(.23) 17.21(.28)	0ct 18.24(.15) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.79(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.49(.10) 17.55(.16) 16.49(.10) 17.55(.16) 18.26(.23) 17.37(.12) 18.24(.16) 16.36(.25) 17.05(.27) 19.17(.25) 16.11(.31) 16.91(.32) 15.59(.20) 19.19(.25) 18.49(.28)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.28) 18.31(.32) 18.31(.32) 18.31(.37) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.34(.15) 20.61(.32) 17.27(.24) 18.96(.23) 16.24(.15) 20.04(.23) 18.95(.16)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.81(.35) 21.73(.31) 19.01(.30) 19.83(.35) 18.74(.24) 21.46(.15)
1953 1954 1955 1955 1957 1958 1959 1960 1961 1963 1964 1966 1967 1966 1967 1970 1971 1972 1973 1974 1975 1976	19.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 22.43 (.34) 19.63 (.26) 17.55 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12) 17.40 (.16) 17.64 (.23) 18.44 (.20) 15.72 (.12) 18.00 (.28) 21.18 (.36) 16.88 (.32) 18.14 (.25) 21.18 (.20) 18.54 (.25) 21.18 (.20)	AWG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.45(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.27(.23) 21.77(.23) 21.77(.23) 16.04(.16) 17.48(.15) 17.48(.15) 17.23(.22) 16.91(.33)	18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.37(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.15(.19) 16.33(.28) 16.32(.26) 19.29(.36) 15.80(.22) 16.70(.31) 15.71(.24) 19.00(.23) 17.21(.28) 17.27(.25)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.90(.13) 17.77(.20) 17.53(.18) 17.36(.16) 16.39(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.05(.27) 19.17(.25) 16.11(.31) 16.91(.32) 15.59(.20) 19.19(.25)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.54(.13) 18.31(.32) 18.76(.13) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.39(.13) 17.94(.20) 18.27(.24) 18.27(.24) 18.27(.24) 18.27(.24) 18.24(.15) 20.04(.23) 18.95(.16)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.41(.30) 19.83(.35)
1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1966 1967 1971 1972 1973 1974 1975 1977	79.78(.27) 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.64(.23) 18.44(.20) 18.72(.12) 18.00(.28) 21.18(.36) 16.88(.32) 18.12(.15) 18.46(.25)	AWG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.42(.23) 16.46(.16) 17.48(.15) 17.68(.36) 17.68(.36) 17.68(.36) 17.68(.36) 17.68(.36) 17.68(.36) 17.68(.36) 17.68(.36)	Seg 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.15) 17.48(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.36(.19) 16.33(.28) 16.32(.26) 19.29(.36) 15.80(.22) 16.70(.31) 15.71(.24) 19.00(.23) 17.21(.28)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.05(.27) 19.17(.25) 16.11(.31) 16.91(.32) 15.59(.20) 19.19(.25) 18.49(.28) 18.41(.25)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 18.98(.18) 18.98(.18) 18.54(.28) 18.54(.28) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.13(1.7) 18.20(1.8) 17.67(.16) 18.39(.13) 17.94(.15) 18.34(.15) 20.61(.32) 17.27(.24) 18.96(.23) 18.95(.16) 19.40(.30) 19.25(.27)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.81(.35) 21.73(.31) 19.01(.30) 19.83(.35) 19.74(.24) 21.46(.15) 19.45(.24) 20.49(.24)
1953 1954 1955 1955 1957 1958 1960 1962 1963 1964 1965 1966 1971 1972 1971 1972 1974 1975 1976 1977	701 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.40(.16) 17.40(.16) 15.72(.12) 18.44(.20) 15.72(.12) 18.44(.21) 18.44(.20) 15.72(.12) 18.44(.20) 18.74(.21) 18.44(.20) 18.74(.21) 18.44(.20) 18.74(.21) 18.44(.20) 18.74(.25) 18.44(.20) 18.74(.25) 18.44(.25)	AWG 19.06(.21) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.45(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.27(.23) 21.77(.23) 21.77(.23) 16.04(.16) 17.48(.15) 17.48(.15) 17.23(.22) 16.91(.33)	18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.10) 18.00(.11) 16.37(.10) 18.00(.11) 16.31(.14) 17.79(.16) 16.31(.10) 15.76(.13) 18.26(.38) 17.16(.19) 16.33(.28) 16.32(.26) 19.29(.36) 19.29(.36) 19.29(.36) 19.29(.36) 19.29(.36) 19.29(.36) 19.29(.36) 19.29(.36) 19.29(.36)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.37(.12) 16.99(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.37(.12) 18.36(.25) 18.11(.25) 18.49(.28) 18.11(.25) 18.53(.23) 18.39(.23) 17.86(.23)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.54(.13) 18.31(.32) 18.76(.13) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.39(.13) 17.94(.20) 18.27(.24) 18.27(.24) 18.27(.24) 18.27(.24) 18.24(.15) 20.04(.23) 18.95(.16)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.49(.15) 18.29(.21) 19.41(.30) 19.83(.35)
1953 1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1971 1972 1973 1974 1975 1977 1978 1977	19.78(.27) 19.78(.27) 14.60(.35) 17.68(.53) 18.94(.24) 22.43(.34) 19.63(.26) 17.55(.10) 18.04(.22) 17.30(.09) 18.70(.13) 17.10(.18) 20.59(.20) 18.00(.12) 17.40(.16) 17.64(.23) 18.44(.20) 15.72(.12) 18.00(.28) 21.18(.36) 16.88(.32) 18.46(.25) 18.46(.25) 18.49(.35) 18.73(.25) 18.73(.25)	AWG 19.06(.21) 15.57(.41) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.11) 16.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.46(.17) 18.01(.17) 19.01(Seg 18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.15) 17.48(.29) 18.94(.15) 16.64(.18) 17.17(.11) 16.37(.11) 16.11(.14) 16.77(.10) 16.31(.10) 15.76(.13) 18.26(.38) 17.36(.19) 16.33(.28) 16.32(.26) 19.29(.36) 15.80(.22) 16.70(.31) 15.71(.24) 19.00(.23) 17.21(.28) 17.27(.25) 19.01(.28) 17.77(.15)	18.24 (.15) 14.22 (.29) 14.69 (.37) 16.75 (.19) 19.23 (.17) 17.70 (.12) 17.53 (.18) 17.77 (.20) 17.55 (.16) 16.40 (.15) 18.26 (.23) 17.37 (.12) 16.09 (.21) 17.65 (.17) 18.24 (.16) 16.36 (.25) 17.05 (.27) 19.17 (.25) 16.11 (.11) 16.91 (.32) 15.59 (.20) 19.19 (.25) 18.49 (.28) 18.11 (.25) 18.39 (.23) 17.86 (.23) 17.86 (.23) 17.86 (.23) 20.61 (.22)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.14) 18.54(.14) 18.08(.12) 18.13(.17) 16.90(.18) 17.67(.16) 18.39(.13) 17.94(.16) 18.34(.15) 20.61(.32) 17.27(.24) 18.95(.23) 16.24(.15) 20.04(.23) 18.95(.16) 19.40(.30) 19.25(.27)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.39(.17) 19.49(.21) 19.76(.19) 21.49(.21) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.81(.35) 21.73(.31) 19.01(.30) 19.83(.35) 18.74(.24) 21.46(.15) 19.45(.24) 20.49(.24) 21.04(.38) 20.21(.21)
1953 1954 1955 1955 1957 1958 1959 1960 1961 1963 1964 1965 1966 1967 1969 1970 1971 1972 1973 1974 1975 1978 1978 1978	19.78 (.27) 14.60 (.35) 17.68 (.53) 18.94 (.24) 22.43 (.34) 19.63 (.26) 17.55 (.10) 18.04 (.22) 17.30 (.09) 18.70 (.13) 17.10 (.18) 20.59 (.20) 18.00 (.12) 17.40 (.16) 17.64 (.23) 18.44 (.20) 15.72 (.12) 18.00 (.28) 21.18 (.36) 16.88 (.32) 18.14 (.25) 21.18 (.25) 21.18 (.25) 21.18 (.25) 21.18 (.25) 21.18 (.25) 21.18 (.25) 21.18 (.25) 21.18 (.25) 21.18 (.25)	19.06(.21) 15.57(.41) 15.57(.41) 15.54(.45) 17.65(.37) 19.28(.34) 17.37(.10) 16.80(.12) 17.42(.12) 17.42(.12) 17.42(.11) 17.27(.10) 18.24(.17) 16.11(.20) 20.00(.20) 16.75(.13) 16.45(.17) 17.05(.17) 18.01(.17) 16.19(.13) 17.27(.23) 21.77(.23) 21.77(.23) 21.77(.23) 16.04(.16) 17.48(.15) 17.48(.15) 17.23(.22) 16.91(.33) 18.30(.26) 18.35(.13) 18.30(.26) 18.35(.13)	18.20(.34) 14.91(.31) 15.71(.28) 17.48(.29) 18.94(.19) 17.80(.15) 16.64(.18) 17.17(.11) 16.77(.10) 18.00(.11) 16.11(.14) 17.79(.16) 16.81(.10) 15.76(.13) 18.26(.38) 17.36(.19) 16.33(.28) 16.33(.28) 16.32(.26) 19.29(.36) 15.80(.22) 16.70(.31) 15.71(.24) 19.00(.23) 17.21(.28) 17.77(.25) 19.01(.28) 17.77(.25)	0ct 18.24(.35) 14.22(.29) 14.69(.37) 16.75(.19) 19.23(.17) 17.77(.20) 17.53(.18) 17.36(.16) 16.89(.10) 17.55(.16) 16.40(.15) 18.26(.23) 17.37(.12) 16.09(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.37(.12) 16.99(.21) 17.65(.17) 18.24(.16) 16.36(.25) 17.37(.12) 18.36(.25) 18.11(.25) 18.49(.28) 18.11(.25) 18.53(.23) 18.39(.23) 17.86(.23)	19.17(.31) Nov 18.72(.40) 17.11(.26) 17.09(.24) 18.38(.29) 19.07(.16) 18.98(.18) 19.04(.20) 18.78(.24) 18.54(.28) 18.54(.28) 18.31(.32) 18.31(.32) 18.31(.32) 18.31(.32) 18.34(.16) 18.39(.13) 17.94(.16) 18.39(.13) 17.94(.16) 18.39(.13) 17.94(.16) 18.39(.23) 18.96(.23) 18.95(.21) 18.95(.21) 18.95(.27) 18.95(.27)	Dec 18.81(.41) 19.24(.54) 18.12(.37) 19.23(.40) 20.75(.16) 20.25(.31) 19.35(.15) 20.59(.17) 19.49(.21) 19.72(.17) 19.76(.19) 21.49(.15) 19.77(.20) 18.22(.21) 20.82(.24) 19.49(.15) 18.29(.21) 19.81(.35) 18.29(.21) 19.81(.35) 18.74(.24) 21.46(.15) 19.45(.24) 21.46(.15) 19.45(.24) 20.49(.24) 21.04(.38) 20.21(.21)

Table 3. Total cloud amount. Values indicate mean fraction of sky obscured. The standard error of the mean appears in parentheses to the right of each mean value.

	Jan	Feb	Mar	Apr	Mav	Jun
1953	.66(.06)	.58(.06)	.43(.06)	.43(.08)	.54(.06)	.76(.10)
1954	-59(.05)	.75(.05)	.69(.07)	.35(.04)	.85(.05)	.74(.07)
1955	.55(.07)	.61(.06)	.60(.09)	.06(.04)	.69(.08)	.90(.04)
1956	-66(.05)	.46(.10)	.40(.06)	.53(-06)	-65(.08)	.89(.06)
1957	-48(.07)	.80(.05)	.56(.03)	.57(.05)	.55(.06)	.76(.04)
1958	.60(.03)	.68(.03)	.63(.03)	.32(.04)	.54(.04)	.83(.03)
1959	.40(.03)	.58(.02)	.66(.02)	.60(.03)	.83(.03)	.78(.04)
1960	.50(.03)	.50(.03)	.38(.02)	.44(.03)	.51(.03)	.63(.05)
1961	.65(.03)	.44(.03)	.65(.03)	.50(.03)	.49(.04)	.79(.03)
1962	.55(.02)	.54(.03)	.48(.03)	.56(.03)	.53(.04)	.79(.03)
1963	.50(.04)	.52(.03)	.61(.02)	.52(.03)	.66(.03)	.81(.02)
1964	.64(.03)	.66(.03)	.57(.04)	.51(.04)	.72(.06)	.63(.06)
1965	.54(.04)	.49(.04)	.61(.02)	.60(.03)	.63(.03)	.64(.03)
1966	.56(.03)	.44(.03)	.57(.03)	.45(.03)	.62(.03)	.76(.03)
1967	.72(.03)	.51(.05)	.56(.03)	.51(.03)	.46(.04)	.82(.04)
1968	.52(.04)	.52(.03)	.45(.03)	.38(.03)	.65(.04)	.75(.03)
1969	.57(.04)	.55(.04)	.58(.03)	.57(.04)	.70(.05)	.81(.03)
1970	.59(.04)	.43(.04)	.37(.03)	.43(.05)	.62(.04)	.81(.02)
1971	.51(.03)	.58(.04)	.48(.03)	.52(.05)	.68(.06)	.85(.06)
1972	.53(.04)	.49(.04)	.64(.03)	.53(.04)	.69(.04)	.78(.04)
1973	.67(.03)	.61(.05)	.60(.04)	.49(.04)	.40(.05)	.70(.05)
1973	.59(.03)	.52(.04)	.53(.03)	.53(.05)	.77(.03)	.89(.02)
					.72(.03)	.86(.03)
1975 1976	.69(.04) .61(.04)	.50(.04) .59(.08)	.60(.02)	.54(.03) .55(.05)	.62(.04)	.87(.04)
			.63(.03)			.71(.04)
1977	.54(.05)	.68(.03)	.55(.04)	.34(.03)	.53(.04)	
1978	.53(.04)	.65(.04)	.45(.04)	.57(.04)	.54(.05)	.68(.07)
1979	.50(.03)	.53(.04)	.56(.03)	.44(.03)	.67(.04)	.79(.05)
1980	.57(.03)	.53(.03)	.58(.03)	.48(.04)	.57(.03)	.80(.02)
1981	.66(.03)	.63(.03)	.51(.03)	.57(.03)	.66(.03)	.80(.03)
1982	.60(.03)	.58(.03)	.55(.03)	.52(.03)	.58(.04)	-84(.04)
1983	.52(.04)	.47(.02)	.63(.03)	.70(.03)	.75(.03)	-74(-04)
<u> 1984 </u>	.42(.04)	.43(.03)	.45(.03)	.40(.04)	.34(.05)	.74(.04)
1953	Jul .65(.14)	.91(.04)	.74(.07)	.74(.07)	.81(.06)	Dec .67(.07)
1954	.79(.05)	.88(.07)	.92(.05)	.89(.04)	.72(.05)	.75(.08)
1955	.97(.02)	.90(.04)	.90(.04)	.80(.05)	.61(.08)	.44(.10)
1956	.85(.05)	.82(.08)	.84(.05)	.82(.05)	.73(.05)	.49(.08)
1957	.79(.06)	.72(.08)	.85(.04)	.72(.03)	.72(.03)	.64(.03)
1958	.79(.05)	.80(.03)	.90(.02)	.81(.03)	.52(.04)	.45(.06)
1959	.78(.03)	.78(.03)	.79(.04)	.79(.03)	.63(.04)	.51(.03)
1960	.72(.03)	.81(.03)	.90(.02)	.89(.03)		
1961	.94(.01)					
1962		83/ 031			.63(.05)	. 67 (. 04)
1702		.83(.02)	.90(.02)	.78(.03)	.61(.02)	.67(.04) .60(.03)
7062	.90(.02)	.93(.02)	.90(.02) .86(.03)	.78(.03) .88(.02)	.61(.02) .77(.02)	.67(.04) .60(.03) .46(.04)
	.90(.02) .80(.03)	.93(.02) .80(.04)	.90(.02) .86(.03) .88(.02)	.78(.03) .88(.02) .82(.04)	.61(.02) .77(.02) .77(.04)	.67(.04) .60(.03) .46(.04) .68(.05)
1964	.90(.02) .80(.03) .87(.03)	.93(.02) .80(.04) .87(.03)	.90(.02) .86(.03) .88(.02) .86(.03)	.78(.03) .88(.02) .82(.04) .88(.02)	.61(.02) .77(.02) .77(.04) .77(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03)
1964 1965	.90(.02) .80(.03) .87(.03) .88(.03)	.93(.02) .80(.04) .87(.03) .90(.02)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03)
1963 1964 1965 1966	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03)
1964 1965 1966 1967	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03)
1964 1965 1966 1967 1968	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03) .47(.04)
1964 1965 1966 1967 1968 1969	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .86(.05)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03)	.90(.02) .86(.03) .88(.03) .86(.03) .92(.02) .85(.02) .84(.03) .91(.02)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03) .47(.04) .50(.04)
1964 1965 1966 1967 1968 1969	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03) .95(.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04)
1964 1965 1966 1967 1968 1969 1970	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .91(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03) .91(.02) .85(.03)	.78(.03) .88(.02) .82(.04) .82(.02) .86(.03) .89(.02) .85(.04) .83(.03) .82(.03) .95(.02)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04)
1964 1965 1966 1967 1968 1969 1970 1971	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .80(.05) .86(.04) .87(.04) .94(.02) .83(.05)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .88(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03) .91(.02) .85(.03) .91(.03)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03) .95(.02) .85(.05) .78(.04)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .65(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04) .64(.04) .65(.06)
1964 1965 1966 1967 1968 1969 1970 1971 1972	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .83(.05)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .82(.03) .82(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03) .91(.02) .85(.03) .91(.03) .87(.04)	.78(.03) .88(.02) .82(.04) .89(.02) .86(.03) .89(.02) .85(.04) .83(.03) .82(.03) .95(.02) .85(.05) .78(.04)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .65(.04) .86(.05)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .64(.04) .65(.06) .67(.05)
1964 1965 1966 1967 1968 1969 1970 1971 1972 1973	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .83(.05) .82(.03) .91(.02)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .80(.04) .91(.02) .89(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03) .91(.02) .85(.03) .91(.03) .87(.04) .87(.03)	.78(.03) .88(.02) .82(.04) .89(.02) .86(.03) .89(.02) .85(.04) .83(.03) .82(.03) .95(.02) .85(.05) .78(.04) .80(.04)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .59(.03) .86(.05) .81(.05)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03) .47(.04) .50(.04) .56(.04) .64(.04) .65(.06) .67(.05)
1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04) .87(.04) .83(.05) .82(.03) .91(.02) .86(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .86(.03) .80(.04) .91(.02) .89(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .91(.02) .85(.03) .91(.02) .87(.04) .87(.03) .88(.03)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03) .95(.02) .85(.05) .75(.04)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .59(.03) .68(.03) .59(.03) .65(.04) .86(.05) .81(.03) .72(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04) .64(.04) .65(.06) .67(.05) .72(.04)
1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975	.90(.02) .80(.03) .87(.03) .88(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .83(.05) .82(.03) .91(.02) .86(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .82(.03) .82(.03) .89(.03) .89(.03) .89(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03) .91(.02) .85(.03) .91(.03) .87(.03) .88(.03) .89(.03) .89(.03) .89(.03)	.78(.03) .88(.02) .82(.04) .89(.02) .86(.03) .89(.02) .85(.04) .83(.03) .82(.03) .95(.02) .85(.05) .78(.04) .75(.05) .77(.04) .81(.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .59(.03) .68(.03) .59(.03) .65(.04) .86(.05) .81(.03) .72(.04) .78(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04) .56(.06) .67(.05) .72(.04) .57(.05) .64(.04)
1964 1965 1966 1967 1969 1970 1971 1972 1973 1974 1975 1976	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .94(.02) .83(.05) .82(.03) .91(.02) .86(.03) .80(.04)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .80(.04) .91(.02) .89(.03) .89(.03) .89(.03) .80(.04)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03) .91(.02) .85(.03) .91(.03) .87(.04) .87(.03) .88(.03) .89(.03) .77(.03) .83(.04)	.78 (.03) .88 (.02) .82 (.04) .88 (.02) .86 (.03) .89 (.02) .85 (.04) .83 (.03) .95 (.02) .85 (.05) .78 (.04) .80 (.04) .75 (.05) .77 (.04) .81 (.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .59(.03) .59(.04) .86(.05) .81(.04) .78(.04) .78(.04) .78(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03) .47(.04) .50(.04) .56(.04) .56(.06) .67(.05) .72(.04) .57(.05) .64(.04) .53(.04)
1964 1965 1966 1966 1968 1969 1970 1971 1972 1973 1974 1975 1977 1978	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .83(.05) .82(.03) .91(.02) .86(.03) .80(.04) .89(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .80(.04) .91(.02) .89(.03) .93(.03) .93(.03) .86(.04) .91(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .91(.02) .85(.03) .91(.02) .87(.04) .87(.03) .87(.04) .87(.03) .88(.03) .77(.03) .83(.04) .80(.04)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03) .95(.02) .85(.05) .75(.04) .80(.04) .75(.05) .77(.04) .81(.03) .81(.04)	.61(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .65(.05) .81(.03) .72(.04) .78(.04) .78(.04) .78(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04) .65(.06) .67(.05) .72(.04) .57(.05) .64(.04) .53(.04)
1964 1965 1966 1966 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978	.90(.02) .80(.03) .87(.03) .88(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .83(.05) .82(.03) .91(.02) .86(.03) .91(.02) .89(.03) .95(.01) .85(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .88(.03) .89(.03) .89(.03) .89(.03) .89(.03) .84(.04) .84(.04) .84(.04)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .88(.03) .91(.02) .85(.03) .91(.03) .87(.03) .87(.03) .88(.03) .97(.03) .83(.03)	.78(.03) .88(.02) .82(.04) .89(.02) .86(.03) .89(.02) .85(.04) .83(.03) .82(.03) .95(.02) .85(.05) .75(.05) .77(.04) .81(.03) .81(.03) .81(.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .65(.04) .86(.05) .81(.03) .72(.04) .78(.04) .78(.04) .72(.02) .68(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03) .47(.04) .50(.04) .56(.04) .56(.06) .67(.05) .72(.04) .57(.05) .64(.04) .41(.05) .50(.03) .49(.06)
1964 1965 1966 1966 1968 1969 1970 1971 1972 1973 1974 1975 1977 1978	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .83(.05) .92(.03) .91(.02) .86(.03) .80(.04) .89(.03) .95(.01) .85(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .80(.04) .91(.02) .89(.03) .93(.03) .93(.03) .86(.04) .91(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .91(.02) .85(.03) .91(.02) .87(.04) .87(.03) .87(.04) .87(.03) .88(.03) .77(.03) .83(.04) .80(.04)	.78 (.03) .88 (.02) .82 (.04) .88 (.02) .89 (.02) .85 (.04) .83 (.03) .82 (.03) .95 (.02) .85 (.05) .78 (.04) .80 (.04) .75 (.05) .77 (.04) .81 (.03) .81 (.03) .81 (.03) .82 (.02)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .59(.03) .86(.05) .81(.03) .72(.04) .78(.04) .78(.04) .78(.04) .78(.04) .78(.04) .79(.02)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03) .47(.04) .50(.04) .56(.04) .64(.04) .65(.06) .67(.05) .72(.04) .57(.05) .64(.04) .53(.04) .41(.05) .50(.03) .49(.06)
1964 1965 1966 1967 1968 1970 1971 1972 1973 1974 1975 1977 1978 1978 1980	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .82(.03) .91(.02) .86(.03) .80(.04) .89(.03) .99(.01) .85(.03) .90(.01) .85(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .80(.04) .91(.02) .89(.03) .93(.03) .93(.03) .80(.04) .81(.03) .90(.02) .83(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .84(.03) .91(.02) .85(.03) .91(.02) .87(.04) .87(.03) .88(.03) .77(.03) .88(.03) .77(.03) .83(.04) .83(.03) .81(.02) .92(.02)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03) .95(.02) .85(.05) .77(.04) .81(.03) .81(.03) .81(.04) .81(.03) .82(.03)	.61(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .65(.05) .81(.03) .72(.04) .78(.04) .78(.04) .72(.02) .68(.04) .78(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04) .65(.06) .67(.05) .72(.04) .57(.05) .72(.04) .53(.04) .53(.04) .54(.04) .53(.04) .54(.05) .50(.03) .49(.06) .48(.04) .51(.03)
1964 1965 1966 1967 1968 1969 1971 1972 1973 1974 1975 1976 1977 1978 1979 1981	.90(.02) .80(.03) .87(.03) .88(.03) .88(.03) .80(.05) .86(.04) .94(.02) .83(.05) .82(.03) .91(.02) .86(.03) .95(.03) .95(.01) .87(.02) .88(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .88(.03) .89(.03) .89(.03) .89(.03) .89(.03) .84(.04) .84(.04) .84(.04) .84(.03) .90(.02) .83(.02)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .85(.02) .84(.03) .81(.03) .81(.03) .82(.03) .83(.03) .83(.03) .84(.03) .84(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03) .85(.03)	.78(.03) .88(.02) .82(.04) .89(.02) .86(.03) .89(.02) .85(.04) .83(.03) .82(.03) .95(.02) .85(.05) .75(.05) .75(.05) .77(.04) .81(.03) .81(.03) .81(.03) .81(.03) .82(.02) .67(.03)	.61(.02) .77(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .59(.03) .68(.04) .86(.05) .81(.03) .72(.04) .78(.04) .72(.02) .68(.04) .72(.02) .68(.04) .72(.02) .73(.03) .75(.03)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .61(.03) .47(.04) .50(.04) .56(.04) .56(.06) .67(.05) .72(.05) .64(.04) .41(.05) .50(.03) .49(.06) .48(.04) .51(.03)
1964 1965 1966 1967 1968 1970 1971 1972 1973 1974 1975 1976 1977 1978 1980	.90(.02) .80(.03) .87(.03) .88(.03) .77(.03) .88(.03) .80(.05) .86(.04) .87(.04) .94(.02) .82(.03) .91(.02) .86(.03) .80(.04) .89(.03) .99(.01) .85(.03) .90(.01) .85(.03)	.93(.02) .80(.04) .87(.03) .90(.02) .83(.03) .91(.03) .93(.02) .83(.03) .91(.03) .80(.04) .91(.02) .89(.03) .93(.03) .93(.03) .80(.04) .81(.03) .90(.02) .83(.03)	.90(.02) .86(.03) .88(.02) .86(.03) .92(.02) .84(.03) .91(.02) .85(.03) .91(.02) .87(.04) .87(.03) .88(.03) .77(.03) .88(.03) .77(.03) .83(.04) .83(.03) .81(.02) .92(.02)	.78(.03) .88(.02) .82(.04) .88(.02) .86(.03) .89(.02) .85(.04) .83(.03) .95(.02) .85(.05) .77(.04) .81(.03) .81(.03) .81(.04) .81(.03) .82(.03)	.61(.02) .77(.04) .77(.04) .75(.02) .83(.03) .86(.03) .76(.03) .68(.03) .59(.03) .65(.05) .81(.03) .72(.04) .78(.04) .78(.04) .72(.02) .68(.04) .78(.04)	.67(.04) .60(.03) .46(.04) .68(.05) .51(.03) .61(.03) .47(.04) .50(.04) .56(.04) .65(.06) .67(.05) .72(.04) .57(.05) .72(.04) .53(.04) .53(.04) .54(.04) .53(.04) .54(.05) .50(.03) .49(.06) .48(.04) .51(.03)

Table 4. Atmospheric pressure at sea level. Add 1000.0 to the mean values in the table to yield pressure in millibars. The standard error of the mean appears in parentheses to the right of each mean value; the standard errors are given (directly) in millibars.

1953 11.2(3) 10.4(1) 11.1(3) 13.2(5) 12.5(2) 14.5(2) 1955 12.3(2) 12.2(4) 10.2(4) 11.3(3) 13.5(3) 14.7(3) 1955 12.3(3) 10.9(2) 10.4(4) 11.9(5) 13.6(2) 15.2(3) 1956 11.5(2) 10.9(4) 11.1(3) 10.9(3) 12.3(2) 10.3(2) 10.9(3) 1957 12.8(2) 8.6(3) 10.9(3) 9.9(3) 12.3(2) 12.3(2) 1959 12.0(2) 10.9(1) 11.5(2) 11.2(1) 13.3(2) 14.2(3) 1959 12.0(2) 10.9(1) 11.5(2) 11.2(1) 13.3(2) 14.2(3) 1959 12.0(2) 10.9(1) 11.5(2) 11.2(1) 13.3(2) 14.2(3) 1950 11.6(2) 11.5(2) 11.2(1) 13.3(2) 14.2(3) 1950 11.6(2) 11.6(2) 11.5(2) 11.2(1) 13.3(2) 14.2(3) 1951 10.6(4) 10.6(2) 10.6(2) 11.2(1) 13.5(4) 13.2(1) 13.6(2) 11.5(2) 11.2(1) 13.5(4) 13.2(1) 14.2(3) 1952 12.9(1) 11.6(2) 11.6(2) 11.2(1) 13.5(4) 13.2(1) 14.2(3) 1953 12.9(1) 10.5(1) 11.2(2) 12.2(2) 12.7(4) 14.2(3) 1955 11.7(1) 10.2(2) 11.0(2) 11.5(1) 11.3(2) 13.2(1) 14.2(3) 1955 11.7(1) 10.2(2) 10.2(2) 10.2(1) 11.6(2) 13.3(2) 14.3(2) 1956 11.5(2) 12.3(2) 12.3(2) 12.3(2) 13.6(3) 1959 11.2(3) 9.6(1) 11.4(2) 11.3(2) 13.3(2) 14.3(3) 1959 11.2(3) 9.6(1) 11.4(2) 11.3(2) 13.3(2) 14.3(3) 1959 11.2(3) 9.6(1) 11.4(2) 11.3(3) 11.5(2) 13.8(3) 15.3(3) 1977 11.9(2) 10.8(2) 10.8(2) 11.8(1) 11.7(2) 11.5(2) 13.8(3) 15.3(3) 1977 11.9(2) 10.8(2) 10.8(2) 11.8(1) 11.7(2) 11.5(2) 13.8(3) 15.3(3) 1977 11.9(2) 11.6(3) 10.3(2) 11.5(3) 13.3(3) 14.5(3) 1977 11.9(2) 11.6(3) 11.4(3) 11.9(2) 11.5(3) 13.3(3) 14.5(3) 1977 11.9(3) 11.4(3) 11.4(4) 11.9(2) 13.5(3) 13.5(3) 13.5(3) 1977 11.9(2) 11.6(3) 11.6(3) 11.6(3) 11.6(3) 11.6(3) 11.6(3) 11.6(3) 11.6(3) 11.6(3) 11.6(3) 11.6							
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1978 13.9(.4) 14.1(.2) 14.5(.2) 13.8(.2) 12.3(.2) 12.3(.2) 1979 14.9(.2) 14.2(.3) 14.7(.3) 14.8(.2) 14.1(.3) 12.5(.9) 1980 15.1(.2) 15.2(.2) 14.1(.4) 13.8(.3) 13.8(.2) 13.7(.5) 1981 15.0(.3) 16.0(.2) 14.8(.2) 13.9(.2) 13.4(.2) 11.9(.1)	1977		14.3(.2)		14.2(.2)		
1979 14.9(.2) 14.2(.3) 14.7(.3) 14.8(.2) 14.1(.3) 12.5(.9) 1980 15.1(.2) 15.2(.2) 14.1(.4) 13.8(.3) 13.8(.2) 13.7(.5) 1981 15.0(.3) 16.0(.2) 14.8(.2) 13.9(.2) 13.4(.2) 11.9(.1)							
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1981 15.0(.3) 16.0(.2) 14.8(.2) 13.9(.2) 13.4(.2) 11.9(.1)							
	1980	15.1(.2)	15.2(.2)	4404 (.4)			
							11.9(.1)
	1981	15.0(.3)	16.0(.2)	14.8(.2)	13.9(.2)	13.4(.2)	
1984 12.6(,4) 15.3(,3) 14.8(,5) 14.5(,3) 14.2(,1) 11.8(,3)							11.9(.1) 10.0(.2) 14.2(.4)

Table 5. Alongshore component (positive equatorward) of wind stress on the sea surface. Units are dynes per square centimeter. The standard error of the mean appears in parentheses to the right of the mean alongshore stress value. Values in this table multiplied by the factor 3.95 (see text) yield offshore Exman transport in cubic meters per second across each meter width.

	Jan	Feb	Mar	Apr	May	Jun
1953	.36(.06)	.32(.05)	.44(.07)	.99(.20)	.83(.09)	.37(.10)
1954	.24(.03)	.41(.14)	.10(.02)	.46(.05)	.56(.08)	.46(.08)
1955	.40(.09)	.16(.03)	.53(.18)	.18(.08)	.63(.11)	.45(.09)
1956	.16(.02)	.25(.07)	.67(.10)	.83(.09)	.85(.13)	.50(.05)
1957	.31(.06)	.53(.11)	.76(.05)	.86(.10)	.57(.06)	.76(.07)
1958	.40(.05)	.42(.05)	.45(.05)	.61(.06)	.57(.07)	.46(.04)
1959	.34(.03)	.28(.02)	.40(.03)	.42(.04)	.30(.03)	.59(.07)
1960	.23(.03)	.27(.02)	.41(.03)	.49(.04)	.53(.09)	.45(.04)
1961	.20(.02)	.27(.03)	.39(.04)	.48(.03)	.70(.06)	.48(.05)
1962	.42(.02)	.34(.03)	.47(.03)	.52(.04)	.51(.04)	.60(.04)
1963 1964	.32(.04) .49(.04)	.39(.03) .44(.03)	.61(.03) .51(.05)	.47(.03) .71(.07)	.59(.04) .63(.07)	.33(.03) .58(.12)
1965	.29(.04)	.40(.05)	.40(.03)	.53(.06)	.97(.07)	.58(.04)
1966	.60(.04)	.61(.06)	.46(.04)	.75(.06)	.59(.05)	.62(.04)
1967	.40(.04)	.36(.04)	.29(.03)	.30(.03)	.37(.04)	.71(.10)
1968	.15(.02)	.40(.05)	.36(.03)	.36(.03)	.34(.05)	.65(.05)
1969	.29(.04)	.26(.04)	.47(.04)	.56(.04)	.45(.07)	.89(.08)
1970	.33(.04)	.16(.05)	.40(.05)	.56(.06)	.55(.05)	.52(.04)
1971	.17(.04)	.36(.04)	.34(.03)	.59(.08)	.43(.07)	.73(.23)
1972	.29(.03)	.34(.04)	.56(.11)	.55(.04)	.42(.04)	.67(.08)
1973	.57(.06)	.38(.05)	.73(.05)	.68(.08)	.67(.11)	.51(.07)
1974	.32(.04)	.42(.05)	.48(.04)	.68(.07)	.71(.05)	.66(.07)
1975	-40(.04)	.35(.04)	.72(.05)	.63(.05)	-74(.04)	.63(.06)
1976 1977	.21(.04) .32(.06)	.17(.04) .56(.06)	.51(.05) .38(.04)	.77(.07)	.72(.07)	.56(.08)
1978	.37(.05)	.47(.06)	.62(.07)	.57(.05) .71(.08)	.47(.05) .59(.07)	.67(.05) .72(.12)
1979	.49(.05)	.54(.09)	.54(.04)	.68(.05)	.69(.07)	.92(.14)
1980	.44(.04)	.47(.05)	.49(.04)	.49(.05)	.89(.07)	.58(.03)
1981	.52(.04)	.30(.03)	.46(.04)	.54(.04)	.53(.05)	.84(.08)
1982	.35(.04)	.47(.04)	.63(.04)	.55(.04)	.65(.06)	.91(.12)
1983	60/ 061	.66(.04)				
	.69(.06)	.00(.04)	.46(.05)	.74(.08)	.75(.06)	1.07(.09)
1984	.26(.04)	.53(.11)	.80(.13)	.31(.11)	.75(.06) .83(.18)	.87(.13)
1984	.26(.04) Jul	.53(.11) Aug	.80(.13) Sep	.31(.11) Oct	.83(.18) Nov	.87(.13) Dec
1984 1953	.26(.04) Jul .70(.22)	.53(.11) Aug .36(.05)	.80(.13) Sep .46(.06)	.31(.11) Oct .53(.08)	.83(.18) Nov .62(.08)	.87(.13) Dec .27(.05)
1984 1953 1954	.26(.04) Jul .70(.22) .52(.07)	.53(.11) Aug .36(.05) .89(.21)	.80(.13) Sep .46(.06) .83(.09)	.31(.11) _Oct .53(.08) .24(.02)	.83(.18) <u>Nov</u> .62(.08) .30(.04)	.87(.13) Dec .27(.05) .20(.04)
1984 1953 1954 1955	.26(.04) Jul .70(.22) .52(.07) .46(.09)	.53(.11) Aug .36(.05) .89(.21) .88(.14)	.80(.13) Sep .46(.06) .83(.09) .66(.10)	.31(.11) Oct .53(.08) .24(.02) .65(.12)	.83(.18) Nov .62(.08) .30(.04) .60(.08)	.87(.13) Dec .27(.05) .20(.04) .11(.04)
1984 1953 1954	.26(.04) Jul .70(.22) .52(.07)	.53(.11) Aug .36(.05) .89(.21)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05)	.31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08)
1984 1953 1954 1955 1956	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13)	.80(.13) Sep .46(.06) .83(.09) .66(.10)	.31(.11) Oct .53(.08) .24(.02) .65(.12)	.83(.18) Nov .62(.08) .30(.04) .60(.08)	.87(.13) Dec .27(.05) .20(.04) .11(.04)
1984 1953 1954 1955 1956 1957 1958 1959	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07)	.31(.11) OCT .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04)
1984 1953 1954 1955 1956 1957 1958 1959 1960	.26(,04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04)	.80(.13) Seb .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07)	.31(.11) OCT .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03)	.87(.13) Dec -27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04)
1984 1953 1954 1955 1956 1957 1958 1959 1960 1961	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04)	.80(.13) Sep .46(.06) .83(.09) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04)	.31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03)
1984 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04)	.53(.11) Aua .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04)	31(.11) Oct .53(.08) .24(.02) .55(.08) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03) .23(.02)
1984 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .50(.04) .50(.04) .49(.04) .48(.06)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .60(.06) .72(.05)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03) .23(.02) .36(.04)
1984 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .49(.04) .48(.06) .71(.09)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .60(.06) .72(.05)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03) .23(.02) .36(.04) .42(.04)
1984 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) .61(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05)	.53(.11) Aua .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .55(.04) .49(.06) .71(.09) .84(.07) .74(.06)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.01) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03) .23(.02) .36(.04) .42(.04) .49(.04) .49(.04)
1984 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) .61(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05)	.53(.11) Aua .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03) .36(.04) .42(.04) .49(.04) .26(.02) .55(.06)
1954 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1965 1966 1967 1966	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .50(.04) .50(.04) .49(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .71(.08)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03) .23(.02) .36(.04) .42(.04) .49(.04) .49(.04)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .55(.04) .49(.04) .48(.06) .71(.09) .84(.07) .74(.06) .72(.08) .71(.08) .52(.05)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03)	.87(.13)
1954 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06)	.53(.11) Aua .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .71(.08) .52(.05)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .43(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1969 1970 1971	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .50(.04) .50(.04) .49(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .71(.08) .52(.05) .77(.11) .81(.10)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.06) .72(.05) .73(.08) .87(.07) .99(.03) .74(.09) .64(.08) .59(.05) .45(.04) .64(.12) 1.12(.19)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.01) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .34(.03) .34(.03) .35(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .43(.05) .35(.06)	.87(.13) Dec .27(.05) .20(.04) .11(.04) .45(.08) .56(.04) .39(.05) .23(.03) .36(.04) .31(.03) .23(.02) .36(.04) .42(.04) .49(.04) .49(.04) .55(.06) .62(.08) .37(.04) .27(.05) .49(.09) .72(.15)
1984 1953 1954 1955 1956 1957 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .46(.08) .90(.11) .70(.11)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07) .72(.08) .71(.08) .52(.07) .72(.08) .71(.08) .52(.05) .77(.11) .81(.10)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05) .45(.04) .64(.12) 1.32(.19)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .43(.05) .35(.04) .53(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06) .46(.08) .90(.11) .70(.11)	.53(.11) Aua .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .71(.08) .52(.05) .77(.11) .81(.10) 1.16(.12) .64(.08)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .55(.04) .64(.08) .59(.05) .45(.04) .64(.12) 1.12(.19) 1.01(.11) .72(.07)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05) .71(.08)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .43(.05) .35(.04) .58(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1969 1970 1971 1972 1973 1974	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06) .46(.08) .90(.11) .73(.05) .64(.07)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .50(.04) .50(.04) .49(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .71(.08) .52(.05) .77(.11) .81(.10) 1.16(.12) .64(.08) .91(.10)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05) .45(.04) .60(.66) .72(.05) .73(.08)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.01) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .46(.05) .51(.03) .28(.03) .41(.03) .43(.05) .35(.04) .58(.05) .68(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1971 1972 1973 1974 1975	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .76(.04) .54(.05) .76(.04) .54(.05) .76(.04) .54(.05) .70(.10) .58(.06) .46(.08) .90(.11) .73(.05) .64(.07) .59(.05)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07) .72(.08) .71(.08) .71(.08) .71(.08) .71(.08) .52(.07) .72(.08) .71(.08) .52(.05) .77(.11) .81(.10) .16(.12) .64(.08) .91(.10)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05) .45(.04) .64(.12) 1.32(.19) 1.01(.11) .72(.07) .73(.05) .80(.06)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .71(.08) .49(.05) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05) .67(.06)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .49(.03) .26(.03) .46(.05) .41(.03) .43(.05) .35(.04) .58(.05) .36(.05) .36(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1969 1970 1971 1972 1973 1974	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06) .46(.08) .90(.11) .70(.11) .73(.05) .64(.07) .59(.05)	.53(.11) Aua .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .71(.08) .52(.05) .77(.11) .81(.10) 1.16(.12) .64(.08) .91(.10)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .55(.04) .60(.06) .72(.05) .73(.08) .97(.07) .55(.04) .64(.08) .59(.05) .45(.04) .64(.12) 1.12(.19) 1.01(.11) .72(.07) .73(.05) .80(.06)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .51(.08) .49(.05) .71(.08) .49(.05) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05) .67(.06) .46(.04)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .43(.05) .35(.04) .58(.05) .35(.04) .58(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1971 1972 1973 1974 1975 1977	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .76(.04) .54(.05) .76(.04) .54(.05) .76(.04) .54(.05) .70(.10) .58(.06) .46(.08) .90(.11) .73(.05) .64(.07) .59(.05)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07) .72(.08) .71(.08) .71(.08) .71(.08) .71(.08) .52(.07) .72(.08) .71(.08) .52(.05) .77(.11) .81(.10) .16(.12) .64(.08) .91(.10)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05) .45(.04) .64(.12) 1.32(.19) 1.01(.11) .72(.07) .73(.05) .80(.06)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.03) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .71(.08) .49(.05) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05) .67(.06)	.83(.18) .80V .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .35(.04) .58(.05) .58(.05) .59(.04) .58(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1969 1970 1971 1972 1973 1974 1975 1976 1976 1977 1978	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06) .46(.08) .90(.11) .73(.05) .64(.07) .59(.05)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .50(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .51(.08) .52(.05) .77(.11) .81(.10) 1.16(.12) .64(.08) .91(.10) .69(.16) .83(.10)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.12) 1.32(.19) 1.01(.11) .72(.07) .73(.05) .80(.06) .47(.06) .73(.09)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.01) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05) .67(.06) .46(.04) .54(.06)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .41(.03) .28(.03) .41(.03) .28(.03) .41(.03) .28(.03) .41(.03) .53(.06) .55(.04) .58(.05) .36(.04) .58(.05) .36(.04) .51(.06) .57(.04) .51(.06)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1970 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1981	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06) .46(.08) .90(.11) .73(.05) .64(.07) .59(.05) .94(.11) .73(.05) .94(.11) .73(.05) .94(.11) .73(.05) .94(.11) .77(.14) .65(.07)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .55(.04) .50(.04) .48(.06) .71(.08) .71(.08) .72(.07) .72(.08) .71(.08) .52(.07) .72(.11) .81(.10) .16(.12) .64(.08) .91(.10) .69(.16) .83(.10) .69(.08)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05) .45(.04) .64(.12) 1.01(.11) .72(.07) .73(.08) .87(.07) .73(.08) .87(.07) .74(.09) .47(.09) .47(.09) .48(.09) .71(.07) .73(.08) .73(.09) .71(.07) .75(.06) .75(.06) .75(.06)	31(.11) Oct .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05) .67(.06) .46(.04) .54(.06) .65(.05)	.83(.18) .80V .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .35(.04) .58(.05) .58(.05) .59(.04) .58(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1959 1960 1961 1962 1963 1964 1965 1966 1967 1972 1972 1973 1974 1975 1976 1977 1978 1979 1980 1982	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .70(.10) .58(.06) .70(.11) .73(.05) .64(.07) .59(.01) .79(.11) .73(.05) .64(.07) .99(.11) .71(.05) .64(.07) .99(.11) .71(.05) .64(.07) .99(.11) .72(.05) .94(.11) .73(.05) .94(.11) .73(.05) .94(.11) .73(.05) .94(.11) .73(.05) .94(.11) .73(.05)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .50(.04) .49(.04) .48(.06) .71(.08) .71(.08) .72(.07) .72(.08) .71(.08) .52(.07) .72(.11) .81(.10) .16(.12) .64(.08) .91(.10) .69(.08) .66(.09) .74(.04) .64(.04)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05) .41(.06) .73(.07) .73(.05) .73(.05) .73(.07) .73(.07) .73(.07) .73(.07) .73(.07) .73(.07) .73(.07) .73(.07) .73(.07) .73(.07) .73(.09) .74(.09) .74(.09) .75(.06) .85(.09) .96(.12)	31(.11) OCt .53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05) .65(.05) .65(.05) .65(.05)	.83(.18) Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .46(.05) .51(.03) .28(.03) .41(.03) .28(.03) .41(.03) .28(.05) .35(.04) .53(.06) .57(.04) .51(.06) .57(.04) .51(.06) .54(.05)	.87(.13)
1984 1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1970 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1981	.26(.04) Jul .70(.22) .52(.07) .46(.09) .69(.09) 1.01(.11) .51(.05) .38(.04) .59(.05) .67(.06) .60(.04) .54(.05) .62(.05) .63(.05) .76(.04) .54(.05) .90(.10) .58(.06) .57(.06) .46(.08) .90(.11) .73(.05) .64(.07) .59(.05) .94(.11) .73(.05) .94(.11) .73(.05) .94(.11) .73(.05) .94(.11) .77(.14) .65(.07)	.53(.11) Aug .36(.05) .89(.21) .88(.14) .52(.13) .54(.08) .71(.06) .53(.04) .50(.04) .50(.04) .49(.04) .48(.06) .71(.09) .84(.07) .74(.06) .72(.07) .72(.08) .51(.08) .52(.05) .77(.11) .81(.10) 1.16(.12) .64(.08) .91(.10) .69(.16) .83(.10) .69(.08) .66(.09) .74(.04)	.80(.13) Sep .46(.06) .83(.09) .66(.10) .64(.05) .75(.07) .49(.04) .48(.07) .51(.04) .50(.04) .50(.06) .72(.05) .73(.08) .87(.07) .59(.03) .74(.09) .64(.08) .59(.05) .45(.04) .64(.12) 1.01(.11) .72(.07) .73(.08) .87(.07) .73(.08) .87(.07) .74(.09) .47(.09) .47(.09) .48(.09) .71(.07) .73(.08) .73(.09) .71(.07) .75(.06) .75(.06) .75(.06)	-31(.11) Oct 53(.08) .24(.02) .65(.12) .50(.08) .56(.06) .43(.04) .44(.05) .48(.06) .40(.01) .49(.04) .72(.11) .57(.04) .60(.07) .52(.04) .73(.09) .59(.03) .42(.04) .50(.07) .71(.08) .49(.05) .71(.09) .67(.07) .51(.05) .67(.06) .46(.04) .54(.06) .65(.05) .41(.04)	.83(.18) .Nov .62(.08) .30(.04) .60(.08) .45(.04) .44(.04) .26(.03) .31(.03) .34(.03) .38(.02) .51(.04) .53(.06) .36(.05) .49(.03) .26(.03) .26(.03) .28(.03) .41(.03) .28(.03) .41(.03) .28(.05) .51(.04) .53(.06) .55(.04) .56(.05) .56(.04) .56(.05) .51(.06) .57(.04) .54(.05) .54(.05)	.87(.13)

Table 6. Onshore component of wind stress on the sea surface. Units are dynes per square centimeter. The standard error of the mean appears in parentheses to the right of each mean onshore stress value.

						
	Jan	<u>Feb</u>	<u>Mar</u>	Apr	May	Jun
1953	.10(.03)	.02(.03)	.00(.05)	12(.04)	.02(.04)	06(.05)
1954	.04(.01)	.07(.05)	.00(.01)	.10(.02)	04(.03)	.04(.02)
1955	04(.03)	.02(.01)	.19(.07)	.09(.08)	01(.03)	01(.03)
1956	.06(.03)	.08(.03)	.08(.08)	.01(.04)	.01(.05)	.10(.04)
1957	.05(.02)	06(.05)	06(.02)	04(.03)	.00(.04)	.06(.03)
1958	.07(.01)	.08(.02)	.09(.02)	.01(.02)	.02(.02)	.08(.02)
				.06(.01)	.04(.02)	.17(.03)
1959	.05(.01)	.07(.01)	.01(.02)			
1960	.07(.01)	.04(.01)	.05(.01)	.04(.02)	.03(.01)	.02(.02)
1961	.03(.01)	.01(.01)	.06(.02)	.05(.01)	.03(.02)	.04(.02)
1962	.08(.01)	.01(.02)	.04(.01)	.02(.02)	.02(.02)	03(.01)
1963	.06(.01)	.02(.02)	.08(.01)	.01(.01)	.01(.02)	.01(.01)
1964	.05(.02)	.03(.01)	.04(.02)	07(.03)	.00(.04)	.06(.03)
1965	.06(.02)	.05(.02)	.01(.01)	.06(.02)	08(.03)	.03(.02)
1966	.05(.02)	.06(.02)	.09(.03)	06(.02)	.03(.02)	.06(.02)
1967	.02(.02)	.08(.02)	.02(.02)	.03(.01)	.09(.02)	.08(.05)
			.04(.01)	.02(.01)	.01(.03)	.01(.02)
1968	.03(.01)	.02(.02)				
1969	.04(.01)	.04(.02)	.00(.01)	.03(.02)	.05(.03)	03(.03)
1970	.04(.02)	~.08 (.05)	.05(.02)	.10(.03)	.08(.02)	.03(.01)
1971	.05(.02)	.04(.02)	.00(.02)	.03(.04)	03(.02)	08(.07)
1972	.04(.01)	06(.05)	96(.07)	.03(.02)	.00(.02)	.06(.04)
1973	.13(.03)	.07(.02)	02(.02)	.13(.04)	02(.04)	.15(.05)
1974	.04(.02)	.02(.02)	04(.02)	.02(.04)	01(.02)	.03(.03)
1975	.02(.02)	.07(.02)	05(.02)	04(.02)	.00(.02)	01(.02)
1976	.03(.01)	.02(.04)	.01(.02)	06(.04)	.01(.02)	.03(.04)
			.06(.02)	.07(.03)	.02(.02)	01(.03)
1977	.07(.02)	03(.03)				07(.05)
1978	.04(.03)	.09(.03)	.05(.03)	03(.02)	.03(.02)	
1979	.03(,02)	~.08(.04)	.08(.03)	.03(.02)	03(.03)	04(.04)
1980	.08(.02)	.06(.02)	.02(.02)	.03(.03)	05(.03)	08(.02)
1981	.02(.02)	.00(.02)	.05(.02)	01(.02)	.01(.02)	.01(.03)
1982	.06(.02)	.10(.03)	.00(.02)	01 (.02)	.06(.03)	09(.06)
1983	.15(.03)	.00(.02)	03(.03)	01(.07)	.07(.03)	.05(.04)
1984	!!					
	.06(,02)	~.04(.02)	08(,06)	10(.06)	.08(.07)	.14(,05)
1797				10(.06) Oct	.08(.07) Nov	Dec . 14 (, 05)
	Jul	Aug	Sep	0ct	Nov	Dec
1953	Jul .15(.04)	Aug .06(.02)	Sep .12(.03)	Oct .07(.07)	Nov .08(.03)	Dec .04(.02)
1953 1954	Jul .15(.04) .06(.03)	Aug .06(.02) 02(.11)	Sep .12(.03) .19(.08)	Oct .07(.07) .04(.01)	Nov .08(.03) .21(.05)	.04(.02) .08(.02)
1953 1954 1955	Jul .15(.04) .06(.03) .08(.04)	.06(.02) 02(.11) .04(.06)	Sep .12(.03) .19(.08) .09(.04)	.07(.07) .04(.01) .09(.02)	Nov .08(.03) .21(.05) .12(.05)	.04(.02) .08(.02) .05(.01)
1953 1954 1955 1956	Jul .15(.04) .06(.03) .08(.04) .02(.06)	Aug .06(.02) 02(.11) .04(.06) .31(.08)	Sep .12(.03) .19(.08) .09(.04) .13(.04)	Oct .07(.07) .04(.01) .09(.02) .14(.03)	Nov .08(.03) .21(.05) .12(.05) .06(.03)	Dec .04(.02) .08(.02) .05(.01) .06(.02)
1953 1954 1955 1956 1957	Jul .15(.04) .06(.03) .08(.04) .02(.06) 05(.09)	Aug .06(.02) 02(.11) .04(.06) .31(.08) .18(.05)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03)	Oct .07(.07) .04(.01) .09(.02) .14(.03) .07(.02)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02)
1953 1954 1955 1956 1957 1958	Jul .15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03)	Aug .06(.02) 02(.11) .04(.06) .31(.08) .18(.05) .23(.05)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02)	Oct .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02)
1953 1954 1955 1956 1957 1958 1959	.15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03) .04(.02)	Aug .06(.02) 02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06)	Oct .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01)
1953 1954 1955 1956 1957 1958 1959	Juj .15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03) .04(.02)	Aug .06(.02) 02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02)	Oct .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01)
1953 1954 1955 1956 1957 1958 1959 1960 1961	Jul .15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03) .04(.02)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02)	Oct .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .05(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01)
1953 1954 1955 1956 1957 1958 1959	Juj .15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03) .04(.02)	Aug .06(.02) 02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02)	Oct .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01)
1953 1954 1955 1956 1957 1958 1959 1960 1961	Juj .15(.04) .06(.03) .08(.04) .02(.06) -05(.09) .12(.03) .04(.02) .06(.02) .05(.01) .03(.02)	Aug .06(.02) -02(.11) .04(.06) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02)	Sep .12(.03) .19(.08) .09(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02) .09(.02)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03)	Nov .08(.03) .21(.05) .12(.05) .10(.02) .05(.01) .02(.01) .02(.01) .03(.01) .08(.01) .03(.04)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962	Juj .15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03) .04(.02) .06(.02) .04(.02) .05(.01) .03(.02) .04(.02)	Aug .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02) .09(.02) .10(.03)	OCE .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .08(.01) .03(.04) .05(.02)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.02)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963	Juj .15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03) .04(.02) .06(.02) .04(.02) .05(.01) .03(.02) .04(.02)	Aug .06(.02) -02(.11) .04(.06) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02)	Sep .12(.03) .19(.08) .09(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02) .09(.02)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03)	Nov .08(.03) .21(.05) .12(.05) .10(.02) .05(.01) .02(.01) .02(.01) .03(.01) .08(.01) .03(.04)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964	Juj .15(.04) .06(.03) .08(.04) .02(.06) 05(.09) .12(.03) .04(.02) .06(.02) .04(.02) .05(.01) .03(.02) .04(.02)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02) .09(.02) .10(.03)	OCE .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .08(.01) .03(.04) .05(.02)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.02)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966	Juj .15 (.04) .06 (.03) .08 (.04) .02 (.06) -05 (.09) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) -02(.02) .15(.03)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02) .10(.03) .10(.03) .08(.02)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02) .17(.04) .15(.02)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .06(.03) .05(.01) .02(.01) .03(.01) .08(.01) .03(.04) .05(.02) .13(.03) .06(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.02) .08(.02)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965	.15 (.04) .06 (.03) .08 (.04) .02 (.06) 05 (.09) .12 (.03) .04 (.02) .06 (.02) .05 (.01) .03 (.02) .04 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .08 (.02) .09 (.02)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) 02(.02) .15(.03) .06(.04)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.03) .10(.03) .10(.03) .08(.02) -01(.03)	OCT .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02) .17(.04) .15(.02) .09(.03)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .08(.01) .03(.04) .05(.02) .13(.03) .06(.01) .03(.04)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .09(.02) .04(.01) .09(.02) .04(.02) .04(.02) .02(.02) .03(.02)
1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967	.13(.04) .06(.03) .08(.04) .02(.06) -05(.09) .12(.03) .04(.02) .06(.02) .05(.01) .03(.02) .04(.02) .01(.03) .05(.02) .01(.03)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) -02(.02) .15(.03) .06(.04)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02) .10(.02) .09(.02) .10(.03) .10(.03) .08(.02)	OCT .07 (.07) .04 (.01) .09 (.02) .14 (.03) .05 (.02) .20 (.03) .05 (.01) .07 (.02) .15 (.03) .11 (.02) .17 (.04) .15 (.02) .09 (.03) .11 (.02)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.04) .05(.02) .13(.03) .06(.01) .03(.04)	.04 (.02) .08 (.02) .05 (.01) .06 (.02) .11 (.02) .04 (.01) .06 (.02) .04 (.01) .09 (.02) .07 (.02) .08 (.02) .09 (.01) .12 (.01) .12 (.03)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1966 1967	.13 (.04) .06 (.03) .08 (.04) .02 (.06) -05 (.09) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.02) .05 (.02)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02)	.12(.03) .19(.08) .09(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.02) .10(.03) .10(.03) .08(.02) -01(.03) .08(.02)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.01) .03(.02) .03(.02) .03(.03) .06(.01) .03(.02) .08(.01) .03(.02) .08(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.01) .12(.03) -06(.04) .09(.02)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1966	.13 (.04) .06 (.03) .08 (.04) .02 (.06) 05 (.09) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .04 (.02) .04 (.02) .05 (.01) .03 (.02) .05 (.02) .05 (.02) .07 (.02)	Aug .06(.02) -02(.01) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02) .08(.02)	Sep .12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) .08(.02)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01) .18(.04)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.02) .13(.03) .06(.01) .03(.02) .08(.01) .07(.01)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .09(.02) .04(.01) .09(.02) .04(.02) .04(.02) .04(.02) .09(.02) .09(.03)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970	.15 (.04) .15 (.04) .06 (.03) .08 (.04) .02 (.06) -05 (.09) .12 (.03) .04 (.02) .05 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.02) .01 (.03) .05 (.02) .03 (.04) .02 (.02) .07 (.02) .07 (.02)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) .15(.03) .06(.04) .09(.03)02(.02) .08(.02) .14(.04)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.03) .10(.03) .08(.02) -01(.03) .12(.05) .08(.02)	OCE .07 (.07) .04 (.01) .09 (.02) .14 (.03) .07 (.02) .20 (.03) .05 (.01) .07 (.02) .15 (.03) .11 (.02) .17 (.04) .15 (.02) .17 (.04) .15 (.02) .17 (.04) .18 (.04) .00 (.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .06(.03) .10(.02) .05(.01) .05(.01) .03(.01) .03(.04) .05(.02) .13(.03) .06(.01) .03(.04) .05(.02) .08(.01) .01(.01) .02(.01) .03(.02) .08(.01) .03(.02) .08(.01) .07(.01) .12(.03)	.04 (.02) .08 (.02) .05 (.01) .06 (.02) .11 (.02) .04 (.01) .06 (.02) .04 (.01) .09 (.02) .07 (.02) .08 (.02) .09 (.02) .09 (.01) .12 (.03) .09 (.03) .09 (.03) .09 (.03) .09 (.03)
1953 1954 1955 1956 1957 1958 1959 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970	.13 (.04) .06 (.03) .08 (.04) .02 (.06) .02 (.06) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .07 (.02) .08 (.02) .09 (.02) .09 (.02) .09 (.02) .01 (.03) .04 (.04)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02) .08(.02) .14(.04) .07(.03)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .05(.03) .11(.02) .17(.04) .15(.02) .04(.01) .18(.04) .00(.03) .10(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.04) .05(.02) .13(.03) .06(.01) .03(.02) .08(.01) .07(.01) .12(.03) .06(.02) .19(.04)	Dec .04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.01) .12(.03) -06(.04) .09(.02) .09(.03) -02(.04) .14(.03)
1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971	.13 (.04) .06 (.03) .08 (.04) .02 (.06)05 (.09) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .05 (.02) .05 (.02) .05 (.02) .07 (.02) .08 (.02) .09 (.04) .09 (.09 (.09) .09 (.09) .09 (.09 (.09) .09 (.09) .09 (.09 (.09) .09 (.09)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02) .14(.04) .07(.03) .01(.05)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .09(.02) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02)01(.03) .12(.05)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.03) .01(.05)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.02) .13(.03) .06(.01) .07(.01) .12(.03) .06(.02) .19(.04)	.04(.02) .08(.02) .05(.01) .06(.02) .05(.02) .04(.01) .06(.02) .04(.01) .09(.02) .04(.02) .04(.02) .04(.02) .09(.02) .02(.04) .02(.04) .09(.02) .02(.04) .09(.03)02(.04) .09(.03)02(.04) .14(.03) .05(.03)
1953 1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1965 1966 1966 1969 1970 1971 1972 1973	.15 (.04) .15 (.04) .06 (.03) .08 (.04) .02 (.06) -05 (.09) .12 (.03) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .06 (.02) .01 (.03) .05 (.02) .03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) .03 (.04) .03 (.04) .03 (.04)	.06(.02) .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) .02(.02) .05(.05) .02(.02) .15(.03) .06(.04) .09(.03) .09(.03) .04(.04) .07(.03) .01(.05)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.03) .10(.03) .08(.02) -01(.03) .12(.05) .08(.02) .10(.03) .12(.08) .10(.03)	00t 07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.03) .11(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .10(.02) .05(.01) .05(.01) .03(.01) .03(.04) .05(.02) .13(.03) .06(.01) .03(.02) .12(.03) .06(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .19(.04) .01(.02) .03(.03)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.01) .12(.03) .06(.04) .09(.02) .09(.02) .04(.03) .06(.03) .06(.03) .06(.03)
1953 1954 1955 1955 1956 1957 1958 1959 1960 1961 1963 1964 1965 1966 1967 1968 1970 1970 1971 1972 1973	.13 (.04) .06 (.03) .08 (.04) .02 (.06) .02 (.06) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.02) .04 (.02) .07 (.02) .07 (.02) .07 (.02) .07 (.02) .08 (.04) .09 (.04) .09 (.04) .09 (.06) .09 (.06) .09 (.07) .09 (.08) .09 (.09) .09 (.09) .09 (.09) .09 (.09) .09 (.09) .09 (.09) .09 (.09) .09 (.09) .09 (.09) .09 (.09)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02) .14(.04) .07(.03) .01(.05)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.08) .01(.06) .13(.03) .12(.08) .01(.06)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .05(.03) .11(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.03) .11(.03) .11(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.01) .03(.02) .13(.03) .06(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.02) .03(.03)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.02) .09(.03)06(.04) .09(.03)02(.04) .14(.03) .09(.03)02(.04) .14(.03) .04(.03) .04(.02)
1953 1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1965 1966 1966 1969 1970 1971 1972 1973	.15 (.04) .15 (.04) .06 (.03) .08 (.04) .02 (.06) -05 (.09) .12 (.03) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .06 (.02) .01 (.03) .05 (.02) .03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) .03 (.04) .03 (.04) .03 (.04)	.06(.02) .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) .02(.02) .05(.05) .02(.02) .15(.03) .06(.04) .09(.03) .09(.03) .04(.04) .07(.03) .01(.05)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .09(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.05)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.04) .05(.02) .13(.03) .06(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .09(.01)	.04(.02) .08(.02) .05(.01) .06(.02) .05(.02) .04(.01) .06(.02) .04(.01) .09(.02) .04(.02) .04(.02) .02(.04) .09(.02) .02(.04) .09(.02) .02(.04) .09(.03)02(.04) .14(.03) .05(.03) .13(.03) .04(.02)
1953 1954 1955 1955 1956 1957 1958 1959 1960 1961 1963 1964 1965 1966 1967 1968 1970 1970 1971 1972 1973	.13 (.04) .06 (.03) .08 (.04) .02 (.06)05 (.09) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .04 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) .02 (.02) .04 (.04) .02 (.02) .06 (.03) .03 (.04)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02) .14(.04) .07(.03) .01(.05)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .08(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.08) .01(.06) .13(.03) .12(.08) .01(.06)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .05(.03) .11(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.03) .11(.03) .11(.03)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.04) .05(.02) .13(.03) .06(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .09(.01)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.02) .09(.03)06(.04) .09(.03)02(.04) .14(.03) .09(.03)02(.04) .14(.03) .04(.03) .04(.02)
1953 1954 1955 1955 1957 1958 1959 1960 1961 1963 1964 1965 1966 1967 1968 1969 1970 1970 1971 1972 1973	.15 (.04) .15 (.04) .06 (.03) .08 (.04) .02 (.06) .02 (.06) .05 (.09) .12 (.03) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .08 (.02) .09 (.02) .09 (.02) .01 (.03) .04 (.04) .02 (.02) .01 (.03) .04 (.04) .02 (.02) .03 (.04) .02 (.02) .05 (.03) .03 (.04) .02 (.02) .05 (.03) .03 (.04) .05 (.07)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02) .14(.04) .07(.03) .01(.05) .04(.03) .01(.05) .04(.03) .01(.05)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .09(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.05) .08(.02) -01(.03) .12(.05)	00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.01) .03(.02) .13(.03) .06(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.02) .03(.03)	.04(.02) .08(.02) .05(.01) .06(.02) .05(.02) .04(.01) .06(.02) .04(.01) .09(.02) .04(.02) .04(.02) .02(.04) .09(.02) .02(.04) .09(.02) .02(.04) .09(.03)02(.04) .14(.03) .05(.03) .13(.03) .04(.02)
1953 1954 1955 1955 1955 1957 1958 1960 1961 1963 1964 1965 1966 1967 1968 1970 1970 1971 1972 1973 1974 1975 1976	.13 (.04) .06 (.03) .08 (.04) .02 (.06) .02 (.06) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .06 (.02) .07 (.02) .07 (.02) .07 (.02) .08 (.02) .09 (.03) .04 (.04) .02 (.02) .07 (.03) .04 (.04) .02 (.02) .05 (.07) .01 (.03) .03 (.04) .05 (.07) .11 (.05)	.06(.02) .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) .02(.02) .15(.03) .06(.04) .09(.03) .02(.02) .14(.04) .07(.03) .01(.05) .04(.03) .03(.05) .04(.03) .03(.05) .01(.06)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .09(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) -01(.03) .12(.08) .01(.03) .12(.08) .01(.03) .12(.08) .01(.03) .12(.08) .01(.03) .12(.08) .01(.03) .07(.03)	.000 .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .05(.03) .11(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03) .11(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .10(.02) .05(.01) .03(.01) .03(.01) .03(.01) .03(.01) .03(.02) .05(.01) .03(.02) .13(.03) .06(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .09(.04) .01(.02) .03(.03) .02(.04) .07(.01) .07(.01) .07(.01) .07(.01)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.02) .09(.03)06(.04) .09(.03)02(.04) .14(.03) .06(.03) .13(.03) .04(.02) .13(.04) .02(.03)
1953 1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1971 1972 1973 1974 1975 1976 1977	.15(.04) .15(.04) .06(.03) .08(.04) .02(.06) -05(.09) .12(.03) .04(.02) .06(.02) .04(.02) .01(.03) .05(.02) .01(.03) .05(.02) .01(.03) .05(.02) .01(.03) .05(.02) .01(.03) .05(.02) .01(.03) .05(.02) .01(.03) .05(.02) .07(.02) .01(.03) .04(.04) .02(.02) .01(.03) .03(.04) .02(.02) .01(.03) .03(.04) .02(.02) .01(.03) .03(.04) .02(.02) .01(.03) .03(.04) .02(.02) .01(.03)	Aug .06(.02) -02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .01(.02) .05(.05) -02(.02) .15(.03) .06(.04) .09(.03) -02(.02) .14(.04) .07(.03) .01(.05) .04(.03) .01(.05) -01(.06) -10(.04)		00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .08(.02) .05(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.05) .12(.03) .11(.03) .01(.05) .12(.03) .08(.02) .08(.02)	Nov .08(.03) .21(.05) .12(.05) .06(.03) .10(.02) .05(.01) .02(.01) .03(.01) .03(.01) .03(.01) .03(.02) .13(.03) .06(.02) .13(.03) .06(.02) .19(.04) .01(.02) .03(.03) .08(.03) .08(.03) .08(.03) .08(.03) .08(.03) .08(.03)	.04 (.02) .08 (.02) .05 (.01) .06 (.02) .11 (.02) .04 (.01) .06 (.02) .04 (.01) .09 (.02) .07 (.02) .08 (.02) .09 (.01) .12 (.03) .09 (.02) .09 (.01) .12 (.03) .09 (.02) .13 (.03) .13 (.03) .13 (.03) .13 (.03) .13 (.03) .05 (.02) .02 (.04)
1953 1954 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1970 1970 1970 1971 1972 1973 1974 1975 1977 1978	.15 (.04) .15 (.04) .06 (.03) .08 (.04) .02 (.06) .02 (.06) .05 (.09) .12 (.03) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .05 (.02) .01 (.02) .01 (.03) .05 (.02) .03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) .02 (.02) .01 (.03) .03 (.04) .02 (.02) .01 (.03) .03 (.04) .02 (.02) .01 (.03) .03 (.04) .02 (.02) .01 (.03) .03 (.04) .02 (.02) .05 (.07) .11 (.05) .01 (.03) .03 (.04) .05 (.07) .11 (.05) .01 (.03) .12 (.02)	.06(.02) .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) .02(.02) .05(.05) .02(.02) .15(.03) .06(.04) .09(.03) .01(.05) .04(.04) .07(.03) .03(.05) .04(.04) .04(.04) .04(.04) .04(.04) .06(.03) .02(.03)		00t 07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .17(.04) .15(.02) .09(.03) .11(.02) .04(.01) .18(.04) .10(.03) .10(.03) .11(.03) .11(.03) .10(.03) .11(.03) .10(.03) .11(.03) .10(.03) .10(.03) .11(.03) .10(.03) .11(.03) .10(.03) .10(.03) .11(.03) .10(.03) .11(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03) .10(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .10(.02) .05(.01) .05(.01) .02(.01) .03(.01) .08(.01) .03(.02) .13(.03) .06(.01) .03(.02) .08(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .08(.03) .08(.03) .08(.03) .02(.04)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .04(.01) .12(.03) .06(.04) .09(.02) .09(.03) .06(.04) .14(.03) .06(.03) .13(.03) .04(.02) .13(.04) .02(.03) .05(.02) .05(.06) .05(.06)
1953 1954 1955 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1969 1970 1970 1971 1972 1973 1974 1975 1976 1977 1978 1978	.13 (.04) .06 (.03) .08 (.04) .02 (.06) -05 (.09) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .01 (.03) .05 (.02) .03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) -03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) -03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) -03 (.04) .05 (.07) -11 (.05) -01 (.03) -12 (.02) -04 (.03)	.06(.02) .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) .02(.02) .15(.03) .06(.04) .09(.03) .02(.02) .14(.04) .07(.03) .01(.05) .04(.03) .03(.05) .04(.03) .04(.04) .07(.03) .01(.06) .04(.04) .07(.03) .03(.05) .04(.04) .04(.04) .07(.03) .03(.05) .04(.03) .04(.04) .04(.04) .07(.03) .05(.01)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .09(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) -01(.03) .12(.08) .01(.06) .13(.03) .12(.08) .01(.06) .13(.03) .10(.03) .07(.03) .09(.03) .07(.03) .07(.03) .07(.03) .07(.03) .07(.03) .07(.03)	.00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .05(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.05) .12(.03) .11(.03) .11(.03) .11(.03) .10(.03) .11(.03) .10(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .10(.02) .05(.01) .03(.01) .03(.01) .03(.01) .03(.01) .03(.02) .05(.01) .03(.02) .06(.01) .03(.02) .08(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .08(.03) .02(.04) .07(.01) .07(.01) .07(.01) .09(.02) .09(.03) .09(.03) .09(.03) .09(.03)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.01) .12(.03) -06(.04) .09(.02) .09(.03) -09(.03) -00(.04) .14(.03) .06(.03) .13(.03) .04(.02) .13(.04) .02(.03) .04(.02) .10(.03)
1953 1954 1955 1955 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1971 1972 1973 1974 1975 1977 1977 1978 1977	.15 (.04) .15 (.04) .06 (.03) .08 (.04) .02 (.06) .02 (.06) .05 (.09) .12 (.03) .04 (.02) .05 (.02) .04 (.02) .05 (.02) .01 (.03) .05 (.02) .03 (.04) .02 (.02) .07 (.02) .07 (.03) .04 (.04) .07 (.02) .07 (.03) .08 (.02) .07 (.02) .07 (.03) .09 (.04) .09 (.02) .01 (.03) .03 (.04) .02 (.02) .01 (.03) .03 (.04) .03 (.04) .03 (.04) .03 (.04) .05 (.07) -11 (.05) -01 (.03) -12 (.02) -04 (.03) .05 (.04)	.06(.02) .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) .02(.02) .15(.03) .06(.04) .09(.03)02(.02) .14(.04) .07(.03) .01(.05) .04(.03) .04(.04) .04(.04) .04(.04) .04(.04) .04(.03) .05(.03) .05(.01)		OCE OT (.07) .04 (.01) .09 (.02) .14 (.03) .07 (.02) .20 (.03) .05 (.01) .07 (.02) .15 (.03) .11 (.02) .17 (.04) .15 (.02) .09 (.03) .11 (.02) .04 (.01) .18 (.04) .00 (.03) .10 (.03) .11 (.05) .12 (.03) .11 (.03) .11 (.03) .10 (.03) .10 (.03) .10 (.03) .10 (.03) .10 (.03) .10 (.03) .10 (.03) .11 (.03) .11 (.03) .12 (.03) .11 (.03) .15 (.04) .08 (.02) .08 (.02) .08 (.02) .07 (.02) .07 (.02) .15 (.04)	.00 (.03) .21(.05) .12(.05) .12(.05) .10(.02) .05(.01) .05(.01) .03(.01) .03(.04) .05(.02) .13(.03) .06(.01) .03(.04) .05(.02) .13(.03) .06(.01) .03(.02) .08(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .09(.03) .06(.02) .05(.02) .05(.02) .05(.02)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.01) .09(.02) .02(.01) .12(.03) .06(.04) .09(.02) .09(.02) .09(.03) .06(.03) .13(.03) .04(.02) .13(.03) .04(.02) .02(.04) .14(.03) .05(.04) .02(.04) .14(.03) .04(.02) .09(.02) .09(.03) .03(.04) .02(.04) .04(.02) .04(.02) .04(.02) .04(.02) .04(.02) .04(.02)
1953 1954 1955 1955 1956 1957 1958 1960 1961 1962 1963 1964 1965 1966 1967 1969 1970 1970 1971 1972 1973 1974 1975 1976 1977 1978 1978	.13 (.04) .06 (.03) .08 (.04) .02 (.06) -05 (.09) .12 (.03) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .05 (.01) .03 (.02) .04 (.02) .01 (.03) .05 (.02) .03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) -03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) -03 (.04) .02 (.02) .07 (.02) .01 (.03) .04 (.04) -03 (.04) .05 (.07) -11 (.05) -01 (.03) -12 (.02) -04 (.03)	.06(.02) .06(.02) .02(.11) .04(.06) .31(.08) .18(.05) .23(.05) .12(.02) .07(.02) .03(.01) .12(.02) .05(.05) .02(.02) .15(.03) .06(.04) .09(.03) .02(.02) .14(.04) .07(.03) .01(.05) .04(.03) .03(.05) .04(.03) .04(.04) .07(.03) .01(.06) .04(.04) .07(.03) .03(.05) .04(.04) .04(.04) .07(.03) .03(.05) .04(.03) .04(.04) .04(.04) .07(.03) .05(.01)	.12(.03) .19(.08) .09(.04) .13(.04) .05(.03) .12(.02) .17(.06) .06(.02) .09(.02) .10(.03) .10(.03) .10(.03) .10(.03) .12(.05) .08(.02) -01(.03) .12(.08) .01(.06) .13(.03) .12(.08) .01(.06) .13(.03) .10(.03) .07(.03) .09(.03) .07(.03) .07(.03) .07(.03) .07(.03) .07(.03) .07(.03)	.00t .07(.07) .04(.01) .09(.02) .14(.03) .07(.02) .20(.03) .05(.01) .07(.02) .15(.03) .11(.02) .05(.03) .11(.02) .04(.01) .18(.04) .00(.03) .10(.05) .12(.03) .11(.03) .11(.03) .11(.03) .10(.03) .11(.03) .10(.03)	Nov .08(.03) .21(.05) .12(.05) .12(.05) .10(.02) .05(.01) .03(.01) .03(.01) .03(.01) .03(.01) .03(.02) .05(.01) .03(.02) .06(.01) .03(.02) .08(.01) .07(.01) .12(.03) .06(.02) .19(.04) .01(.02) .03(.03) .06(.02) .08(.03) .02(.04) .07(.01) .07(.01) .07(.01) .09(.02) .09(.03) .09(.03) .09(.03) .09(.03)	.04(.02) .08(.02) .05(.01) .06(.02) .11(.02) .06(.02) .04(.01) .06(.02) .04(.01) .09(.02) .07(.02) .04(.01) .12(.03) -06(.04) .09(.02) .09(.03) -09(.03) -00(.04) .14(.03) .06(.03) .13(.03) .04(.02) .13(.04) .02(.03) .04(.02) .10(.03)

Table 7. "Wind cubed" index of rate of addition to the water column, by the wind, of turbulent mixing energy. The standard errors of the mean appear in parentheses to the right of each mean index value. Nominal units are m² sec⁻³.

	Jan	Feb	Mar	Apr	May	Jun
1953	130(34)	107(19)	162(35)	473(140)	354(44)	130(47)
1954	75(16)	205(85)	19(4)	186(32)	210(46)	174(41)
1955	132 (40)	37 (9)	316(101)	93 (22)	238 (67)	177(50)
1956	58(15)	91(30)	287 (46)	355(51)	377 (68)	182 (25)
1957	101(22)	220 (44)	310(23)	375 (64)	201(27)	337 (42)
1958	184(48)	171(32)	181(25)	260 (37)	244(46)	192 (21)
1959	116(13)	94(8)	143(14)	154(18)		300 (47)
1960		86(10)				
	84(11)			207(18)	307(95)	161(19)
1961	71(9)	83(11)	173 (24)	178(13)	301(37)	204 (26)
1962	156(12)	127(16)	171(14)	220(24)	197(20)	226(19)
1963	113(19)	141(19)	252(17)	176(14)	230(20)	113(13)
1964	188(20)	156(14)	198(27)	295(36)	248(41)	315(117)
1965	100(17)	155(33)	144(16)	238(51)	467 (45)	232(20)
1966	247(26)	263(30)	213(25)	312(35)	252(34)	263(24)
1967	147(16)	143(25)	94(13)	102(11)	140(20)	387 (80)
1968	47 (10)	172 (30)	126(15)	120 (11)	142(25)	272 (25)
1969	97 (16)	113(19)	174(18)	206(23)	193 (34)	432 (68)
1970	121(17)	148(36)	166(38)	232 (35)	227 (25)	218(20)
1971	92 (16)	128(25)	120(15)	266(42)		404(162)
1972	102(14)	146(33)	346(70)			
1973	247(29)	136(21)	292 (26)		146(18)	315(51)
1973				333(49)	314(75)	279 (52)
1974 1975	121(17)	155(24)	181(20)	308 (62)	300(29)	295(39)
	135(18)	140(22)	308(24)	251(21)	304(24)	272 (33)
1976	76(22)	68(19)	196(27)	326(39)	308(36)	248 (53)
1977	134(44)	251(40)	158(21)	265(27)	191(27)	263(30)
1978	150(22)	214(33)	280(44)	316(54)	246(35)	327(91)
1979	202(33)	250(54)	241(23)	282(29)	331(38)	459(122)
1980	179(19)	212(32)	203(21)	194(23)	441(47)	241(18)
1981	205(22)	104(13)	195 (19)	212(21)	226(27)	431(73)
1982	134(21)	199(20)	259(19) 203(21)	201(20)	300 (29)	491(97)
1983	319(31)	262(18)	203(21)	420(117)	373 (35)	539(61)
1984	118(21)	307 (120)	534(117)	288(110)	636 (159)	522 (116)
	Jul	Aug	Seo	Oct	Nov	Dec
1953	332(129)	125(26)	179(34)	217(43)	243 (50)	74(16)
1954	207(37)	445(135)	439(73)	64(8)	161(33)	59(13)
1955	179(41)	460(100)	308(76)	322 (79)	266(42)	30(13)
1956	324(56)	346(65)	261(29)	237 (56)	184(23)	158 (35)
1957	484 (66)	253(52)	331(45)	261(38)	189 (24)	238 (22)
1958	214(25)	474(56)	214(26)	228(30)	92 (16)	152(26)
1959	138(16)	233(23)	303 (76)	164(23)	108 (15)	82 (13)
1960	260 (32)	222 (25)	201(19)	198 (35)	99 (12)	144(24)
1961	290 (39)	191(17)	211(20)	199 (24)	136(12)	100(12)
1962	265 (22)	236(23)	267 (32)	199(20)	212(19)	96(15)
1963	220 (26)	176(25)	320(31)	376 (72)	222 (33)	131(19)
1964	250 (25)	385(89)	372 (58)	242(22)	132 (20)	164(21)
1965	263 (29)	392 (45)	442 (52)	319(44)	240(21)	193(20)
1966	317(29)	388 (39)	245(18)	243(28)	95(12)	
1967						
	222(28)	336(41)	357 (59)	369(57)	180(30)	280 (45)
1968	442(61)	352 (56)	326(62)	243(19)	192(16)	283 (42)
1968 1969	442 (61) 237 (33)	352 (56) 312 (52)	326 (62) 272 (29)	243 (19) 154 (26)	192 (16) 104 (13)	283 (42) 151 (23)
1968 1969 1970	442 (61) 237 (33) 248 (34)	352(56) 312(52) 212(28)	326(62) 272(29) 186(22)	243(19) 154(26) 251(50)	192(16) 104(13) 194(24)	283 (42) 151 (23) 139 (22)
1968 1969 1970 1971	442(61) 237(33) 248(34) 190(49)	352(56) 312(52) 212(28) 425(71)	326(62) 272(29) 186(22) 258(66)	243(19) 154(26) 251(50) 302(49)	192 (16) 104 (13) 194 (24) 169 (23)	283 (42) 151 (23) 139 (22) 199 (57)
1968 1969 1970 1971 1972	442(61) 237(33) 248(34) 190(49) 423(63)	352(56) 312(52) 212(28) 425(71) 400(67)	326(62) 272(29) 186(22) 258(66) 805(139)	243(19) 154(26) 251(50) 302(49) 220(27)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157)
1968 1969 1970 1971 1972 1973	442(61) 237(33) 248(34) 190(49) 423(63) 369(81)	352 (56) 312 (52) 212 (28) 425 (71) 400 (67) 784 (81)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25) 237 (28)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37)
1968 1969 1970 1971 1972 1973	442(61) 237(33) 248(34) 190(49) 423(63) 369(81) 299(28)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25) 237 (28) 274 (28)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157)
1968 1969 1970 1971 1972 1973 1974	442(61) 237(33) 248(34) 190(49) 423(63) 369(81) 299(28) 284(35)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45) 316(31)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25) 237 (28)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37)
1968 1969 1970 1971 1972 1973 1974 1975	442(61) 237(33) 248(34) 190(49) 423(63) 369(81) 299(28) 284(35) 264(36)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58) 377(87)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45) 316(31) 370(33)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(15) 328(37)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25) 237 (28) 274 (28)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37) 195 (31)
1968 1969 1970 1971 1972 1973 1974 1975 1976	442(61) 237(33) 248(34) 190(49) 423(63) 369(81) 299(28) 284(35) 264(36) 529(95)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45) 316(31)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25) 237 (28) 274 (28) 143 (24)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37) 195 (31) 147 (23)
1968 1969 1970 1971 1972 1973 1974 1975	442(61) 237(33) 248(34) 190(49) 423(63) 369(81) 299(28) 284(35) 264(36)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58) 377(87)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45) 316(31) 370(33)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35) 328(37) 189(21)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25) 237 (28) 274 (28) 143 (24) 143 (24) 241 (17)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37) 195 (31) 147 (23) 235 (43) 220 (34)
1968 1969 1970 1971 1972 1973 1974 1975 1976	442(61) 237(33) 248(34) 190(49) 423(63) 369(81) 299(28) 284(35) 264(36) 529(95)	352 (56) 312 (52) 212 (28) 425 (71) 400 (67) 784 (81) 317 (57) 461 (58) 377 (87) 392 (59) 310 (54)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45) 316(31) 370(33) 229(37) 350(82)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35) 328(37) 189(21) 226(29)	192(16) 104(13) 194(24) 169(23) 156(25) 237(28) 274(28) 143(24) 270(49) 241(17) 237(49)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37) 195 (31) 147 (23) 235 (43) 220 (34) 203 (28)
1968 1969 1970 1971 1972 1973 1974 1975 1976 1977	442 (61) 237 (33) 248 (34) 190 (49) 423 (63) 369 (81) 299 (28) 284 (35) 264 (36) 529 (95) 434 (85) 290 (51)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58) 377(87) 392(59) 310(54) 433(73)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45) 316(31) 370(33) 229(37) 350(82) 350(51)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35) 328(37) 189(21) 226(29) 274(33)	192 (16) 104 (13) 194 (24) 169 (23) 156 (25) 237 (28) 274 (28) 143 (24) 270 (49) 241 (17) 237 (49) 233 (28)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37) 195 (31) 147 (23) 235 (43) 220 (34) 203 (28) 226 (50)
1968 1969 1970 1971 1972 1973 1974 1975 1976 1977	442 (61) 237 (33) 248 (34) 190 (49) 423 (63) 369 (81) 299 (28) 284 (35) 264 (36) 529 (95) 434 (85) 290 (51) 458 (27)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58) 377(87) 392(59) 310(54) 433(73) 354(31)	326(62) 272(29) 186(22) 258(66) 805(199) 675(74) 352(45) 316(31) 370(33) 229(37) 350(82) 350(51) 382(35)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35) 328(37) 189(21) 226(29) 274(33) 271(28)	192(16) 104(13) 194(24) 169(23) 156(25) 237(28) 274(28) 143(24) 270(49) 241(17) 237(49) 233(28) 181(22)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37) 195 (31) 147 (23) 235 (43) 220 (34) 203 (28) 226 (50) 188 (30)
1968 1969 1970 1971 1972 1973 1974 1975 1975 1977	442(61) 237(32) 248(34) 190(49) 423(63) 369(81) 299(28) 284(35) 264(36) 529(95) 434(85) 290(51) 458(27) 420(49)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58) 377(87) 392(59) 310(54) 433(73) 354(31) 244(21)	326(62) 272(29) 186(22) 258(66) 805(139) 675(74) 352(45) 316(31) 370(33) 229(37) 350(82) 350(51) 382(35)	243 (19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35) 328(37) 189(21) 226(29) 274(33) 271(28) 166(18)	192(16) 104(13) 194(24) 169(23) 156(25) 237(28) 274(28) 143(24) 270(49) 241(17) 237(49) 233(28) 181(22) 249(22)	283 (42) 151 (23) 139 (27) 139 (57) 407 (157) 179 (37) 195 (31) 147 (23) 235 (43) 220 (34) 220 (50) 188 (30) 146 (13)
1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1978 1980	442 (61) 237 (33) 248 (34) 190 (49) 423 (63) 369 (81) 299 (28) 284 (35) 264 (36) 529 (95) 434 (85) 290 (51) 458 (27)	352(56) 312(52) 212(28) 425(71) 400(67) 784(81) 317(57) 461(58) 377(87) 392(59) 310(54) 433(73) 354(31)	326(62) 272(29) 186(22) 258(66) 805(199) 675(74) 352(45) 316(31) 370(33) 229(37) 350(82) 350(51) 382(35)	243(19) 154(26) 251(50) 302(49) 220(27) 348(66) 295(42) 235(35) 328(37) 189(21) 226(29) 274(33) 271(28)	192(16) 104(13) 194(24) 169(23) 156(25) 237(28) 274(28) 143(24) 270(49) 241(17) 237(49) 233(28) 181(22)	283 (42) 151 (23) 139 (22) 199 (57) 407 (157) 179 (37) 195 (31) 147 (23) 235 (43) 220 (34) 203 (28) 226 (50) 188 (30)

Table 8. Daily total (both direct and diffuse) solar radiation absorbed by the ocean, Q_5 . The standard error of the mean appears in parentheses to the right of each mean value. Units are watts/ m^2 . (Values may be converted to units of cal cm² day¹ by multiplying by the factor 2.064.)

1050	Jan	Feb	Mar	Apr	May	Jun
1953	239(12)	253(9)	262(11)	258(15)	193(9)	182(22)
1954 1955	240(9)	214(10)	227(12)	241(6)	141(7)	158(11)
1956	250(12) 255(16)	254(12)	236(17) 257(31)	282(8)	182(17)	125(5)
1957	264(12)	269(16) 203(11)	243(7)	230(12) 221(8)	181(14)	121(3) 153(7)
1958	244(5)	236(8)	243 (9)	248(9)	190(10)	148(6)
1959	287 (7)	247(8)	241(9)	208(10)	169(12)	144(6)
1960	268 (9)	269 (4)	263 (3)	236(4)	204(4)	167(7)
1961	242 (5)	276(5)	228 (5)	221(4)	205(6)	140(4)
1962	258 (5)	257 (4)	260 (4)	214(4)	192 (6)	143(3)
1963	263 (6)	265(5)	240 (4)	217 (0)	176(4)	139(3)
1964	243(6)	236(4)	242(6)	223(6)	162 (8)	161(7)
1965	257(8)	268(7)	236(4)	218(4)	183(4)	165(4)
1966	252(5)	279(5)	246(5)	236(4)	182(5)	148(4)
1967	218(5)	264(8)	244(5)	230(4)	207(6)	138(5)
1968	250(7)	263(5)	265(5)	244(4)	174(6)	149(4)
1969 1970	248(7) 245(7)	257(6)	238(4)	216(5)	168(7)	140(4)
1971	264(6)	274(7) 255(6)	280 (4) 261 (5)	236(7) 230(7)	178(5)	140(2)
1972	256(6)	271(7)	237 (6)	230(7) 221(5)	169(8) 170(6)	130(6)
1973	236(7)	247(9)	237 (5)	229(7)	170(6) 216(7)	145(6) 151(7)
1974	250 (6)	268 (7)	257 (5)	219(8)	156(4)	131(7)
1975	234(7)	268 (6)	240 (4)	224(5)	163(4)	131(3)
1976	245(7)	248 (13)	234(5)	218(8)	178(6)	130(5)
1977	259(8)	235(4)	244(6)	253(4)	187 (5)	154(5)
1978	258(8)	240(7)	265(6)	217(6)	190(6)	153(9)
1979	270(5)	264(7)	246(5)	238 (5)	171(5)	142(7)
1980	248 (6)	261(5)	244 (5)	231(7)	187 (4)	156(5)
1981 1982	233 (5)	241(5)	249(5)	218(5)	183 (6)	142(3)
1982	246(6) 260(8)	257(5) 273(4)	246(4)	230 (5)	187(5)	139(6)
	200(0)					
1984	263 (9)			201(5)	163(4)	149(5)
1984	263 (9) Jul	268 (7)	260(10)	223(10)	204(29)	142(6)
1984	263 (9) <i>Jul</i> 170 (20)	268 (7) Aug	260(10) Sep	223(10) Oct	204 (29) Nov	142(6) Dec
	Jul	268 (7)	260(10)	223(10)	204(29) Nov 211(13)	142(6) Dec 266(15)
1953 1954 1955	Jul 170(20) 149(8) 123(2)	268 (7) Aug 142 (3) 144 (5) 154 (7)	260(10) Sep 204(12) 158(5) 159(2)	223 (10) Oct 227 (16)	204 (29) Nov	142(6) Dec
1953 1954 1955 1956	Jul 170(20) 149(8) 123(2) 134(7)	268 (7) Aug 142 (3) 144 (5) 154 (7) 157 (11)	260(10) Sep 204(12) 158(5) 159(2) 184(9)	223(10) Oct 227(16) 192(7) 217(10) 198(10)	Nov 211(13) 225(19)	142(6) Dec 266(15) 184(11)
1953 1954 1955 1956 1957	Jul 170 (20) 149 (8) 123 (2) 134 (7) 143 (11)	268 (7) Aug 142 (3) 144 (5) 154 (7) 157 (11) 170 (12)	260(10) Sep 204(12) 158(5) 159(2) 184(9) 186(8)	223(10) Oct 227(16) 192(7) 217(10) 198(10) 211(6)	204(29) Nov 211(13) 225(19) 241(15) 195(9) 216(8)	142(6) Dec 266(15) 184(11) 263(26) 261(31) 235(6)
1953 1954 1955 1956 1957 1958	Jul 170 (20) 149 (8) 123 (2) 134 (7) 143 (11) 154 (11)	268 (7) Aug 142 (3) 144 (5) 154 (7) 157 (11) 170 (12) 165 (5)	260(10) Sep 204(12) 158(5) 159(2) 184(9) 186(8) 173(7)	223(10) Oct 227(16) 192(7) 217(10) 198(10) 211(6) 218(9)	204(29) Nov 211(13) 225(19) 241(15) 195(9) 216(8) 254(8)	142(6) Dec 266(15) 184(11) 263(26) 261(31) 235(6) 278(13)
1953 1954 1955 1956 1957 1958 1959	Jul 170 (20) 149 (8) 123 (2) 134 (7) 143 (11) 154 (11) 154 (6)	268(7) Aug 142(3) 144(5) 154(7) 157(11) 170(12) 165(5) 169(8)	260(10) Sep 204(12) 158(5) 159(2) 184(9) 186(8) 173(7) 190(8)	223(10) Oct 227(16) 192(7) 217(10) 198(10) 211(6) 218(9) 218(13)	204(29) Nov 211(13) 225(19) 241(15) 195(9) 216(8) 254(8) 226(7)	142(6) Dec 266(15) 184(11) 263(26) 261(31) 235(6) 278(13) 256(6)
1953 1954 1955 1956 1957 1958 1959	Jul 170 (20) 149 (8) 123 (2) 134 (7) 143 (11) 154 (11) 154 (6) 163 (4)	268(7) Aug 142(3) 144(5) 154(7) 157(11) 170(12) 165(5) 169(8) 171(6)	260(10) Sep 204(12) 158(5) 159(2) 184(9) 186(8) 173(7) 190(8) 171(4)	223(10) Oct 227(16) 192(7) 217(10) 198(10) 211(6) 218(9) 218(13) 185(5)	204(29) Nov 211(13) 225(19) 241(15) 195(9) 216(8) 254(8) 254(8) 226(7) 219(11)	142(6) Dec 266(15) 184(11) 263(26) 261(31) 235(6) 278(13) 256(6) 235(7)
1953 1954 1955 1956 1957 1958 1959 1960	Jul 170 (20) 149 (8) 123 (2) 134 (7) 143 (11) 154 (11) 154 (6) 163 (4) 126 (2)	268(7) Aug 142(3) 144(5) 154(7) 157(11) 170(12) 165(5) 169(8) 171(6) 159(3)	260(10) Sep 204(12) 158(5) 159(2) 184(9) 186(8) 173(7) 190(8) 171(4) 170(2)	223 (10) OCE 227 (16) 192 (7) 217 (10) 198 (10) 211 (6) 218 (9) 218 (13) 185 (5) 210 (6)	204(29) Nov 211(13) 225(19) 241(15) 195(9) 216(8) 254(8) 226(7) 219(11) 243(4)	142(6) Dec 266(15) 184(11) 263(26) 261(31) 235(6) 278(13) 256(6) 235(7) 240(5)
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Table 9. Radiative heat loss, Q_{θ} . The standard error of the mean appears in parentheses to the right of each mean value. Units are watts/ m^2 . (Values may be converted to units of cal cm² day¹ by multiplying by the factor 2.064.)

	Jan	Feb	Mar	Apr	May	Jun
1953	23(2)	28(2)	32 (3)	41(5)	33(3)	33(10)
1954	26(2)	16(2)	22 (3)	43 (2)	16(3)	30 (5)
955	30 (3)	27 (3)	29 (5)	60 (5)	29 (7)	10(2)
956	33 (5)	34(5)	38(13)	41(5)	28 (5)	7(1)
957	33 (3)		26(2)	29(2)		21(2)
958	24(1)	22 (2)	27(2)	39(3)	36(2)	20(2)
959	43(2)	24(2)	28(2)	29(3)	22(4)	18(2)
960	32(2)	33(1)	44(1)	37(1)	38(l)	31(3)
961	26(1)	34(1)	25(1)	34(1)	39(2)	19(1)
962	31(1)	31(1)	36(1)	30(1)	35(2)	21(1)
963	33(1)	31(1)	27(1)	34(0)	27 (1)	18 (1)
964	27 (1)	23(1)	30 (1)	34(2)	23 (3)	30 (3)
965	33(2)	34(2)	27(1)	27 (1)	27(1)	28(1)
966	30(1)	37(1)	29(1)	38(1)	29(1)	21(1)
			30(1)			
967				34(1)	38(2)	19(2)
968	33(2)	33(1)	36(1)	44(1)	28(2)	23(2)
969	29(2)	30(1)	28(1)	29(1)	23(2)	18(1)
970	29(2)	35(2)	42(1)	37(2)	29(2)	19(1)
971	34(1)	30(1)	35(1)	34(2)	26(3)	15(2)
972	32 (1)	32 (2)	24(1)	31(2)	24(2)	18(2)
973	22 (1)	24(2)	27 (1)	36(2)	43 (2)	25(3)
974	30(1)	33 (2)	33(1)	34(2)	20(1)	14(1)
975	23(1)	32(1)	27(1)	32(1)	23(1)	15(1)
976		30(5)				
970 977	27(1) 30(2)		25(1)	31(2)	29(2)	14(2)
			29(1)	43(1)	33 (2)	25(2)
978	31(2)	24(2)	34(1)	31(2)	33(2)	25(4)
979	33(1)	30(l)	27(1)	36(1)	25(2)	20(3)
980	30(1)	29(1)	28(1)	34(2)	31(1)	25(2)
98I	24(1)	24(1)	31(1)	31(1)	28(2)	18(1)
982	29(1)	28(1)	0(1)	35(1)	32 (2)	16(2)
983	28 (2)	31 (1)	22(1)	20 (1)	18(1)	19(2)
984	29 (2)	31 (2)	32 (3)	29 (3)	37(10)	17(2)
	Jul	Aug	Sep	Oct	Nov	Dec
953	30(9)	9(1)	22(4)	26(5)	20(4)	34(3)
954	20(3)	11(3)	10(2)	14(2)	23 (5)	12 (3)
955	8(0)	14(3)	8(1)	22 (3)	31(5)	39(10)
956	16(3)	18(5)	15(3)	19 (4)	15(3)	35(9)
957	17 (5)	19 (4)	18(2)	21(2)	22 (2)	
958	22 (4)	20(2)	14(2)			25(1)
959				25(3)	35(2)	43 (4)
		19(3)	21(3)	24(5)	25(2)	34(1)
960	27(1)	23 (2)	15(1)	11(1)	23(3)	27(2)
961	10(0)	17(1)	13(0)	20(2)	31(1)	29(1)
962	14(0)	11(0)	15(1)	15(1)	20(1)	37 (2)
963	19(1)	19(2)	14(1)	18(2)	21(2)	26(2)
964	15(1)	15(2)	16(1)	15(1)	20(2)	35 (1)
965	14(1)	13(1)	12(0)	15(1)	22 (1)	29(1)
966	22 (1)	18(1)	16(1)	14(1)	17(1)	29(1)
967	15(1)	13(1)	17 (2)	16(2)	15(1)	39(2)
68	20 (3)	11(1)	14(1)	17(1)	22(1)	
969	15(2)	17(1)	12(1)	18(1)		
770					26(1)	31(1)
	15(2)	13(1)	16(1)	10(1)	32(1)	29(2)
71	11(1)	13(1)	12(2)	17(3)	28(2)	26(3)
72	15(2)	19(2)	15(2)	20(2)	15(2)	25(2)
73	17(1)	12(1)	15(1)	20(2)	18(1)	23(1)
74	13(1)	14(1)	15(1)	23(2)	23(2)	32 (2)
75	15(1)	14(2)	14(1)	23 (2)	20 (2)	28 (2)
76	19(2)	11(1)	20(1)	18(1)	19(2)	33 (2)
77	14(1)	16(2)	17 (2)	19(1)	23(1)	41(2)
78	9(0)	17 (2)	19(2)	19(2)		
979	16(2)					34(1)
	13(1)	19(2)	15(1)	22(2)	19(2)	32 (4)
		15(1)	20(1)	19(1)	27(2)	38(2)
980						
980 981	15(1)	19(2)	11(0)	29(2)	30(1)	35(1)
980 981 982	15 (1) 19 (2)	19(2) 13(1)	17 (2)	29(2) 21(1)	20(1)	35(1)
980 981 982 983	15(1)	19(2)				

Table 10. Evaporative heat loss, Q_c . The standard error of the mean appears in parentheses to the right of each mean value. Units are watts/m². (Values may be converted to units of cal cm²day² by multiplying by the factor 2.064.)

						7
1053	Jan 27 61	Feb 24(10)	<u>Mar</u> 39(8)	Apr (26)	May 97(11)	<u>Jun</u> 8(9)
1953	3(6) -23(5)	34(10) 15(4)	8(3)	62(16) -24(4)	27(5)	33(4)
1954 1955	-23(5) 22(7)	-26(5)	39(16)	14(10)	-14(12)	6(5)
1956	17(6)	-27(13)	-1(25)	39(11)	23(9)	33 (6)
1957	-11(3)	43(9)	46(10)	68(13)	59 (8)	64(11)
1958	22(4)	65(7)	31(8)	37 (6)	49(11)	40 (5)
1959	15(3)	15(4)	59 (9)	42 (7)	21(10)	35 (6)
1960	11(2)	18(2)	32 (4)	22 (3)	15(1)	24(4)
1961	9(2)	22 (2)	15(4)	18(2)	34(4)	36(4)
1962	22(2)	33(3)	16(3)	16(4)	26(3)	50(3)
1963	16(3)	24(2)	35(3)	31(0)	46(3)	31(2)
1964	25 (3)	25(2)	19(3)	34(7)	28(5)	30(6)
1965	34(6)	46(5)	45(3)	5 7(5)	109(7)	62 (3)
1966	36(4)	63 (6)	30(4)	51(6)	44(4)	40(3)
1967	17(2)	33(4)	22(3)	14(2)	15(3)	52(8)
1968	6(1)	36(4)	24(3)	12(2)	26(4)	38(4)
1969	28(4)	19(3)	44(3)	51(5)	57 (6)	69 (5)
1970	29(4)	31(11)	34(4)	22 (6)	22 (4)	24(2)
1971	14(2)	11(4)	6(4)	40 (6)	39 (6)	46(10)
1972 1973	20(3)	48(8)	62 (9) 39 (4)	48(4) 30(6)	62 (6) 28 (8)	31(6) 32(9)
1973	47(12) 26(3)	28(7) 26(5)	39(4) 40(4)	58(9)	70(5)	42(4)
1974	26(5)	26(3)	55(4)	54(6)	70(4)	44(4)
1976	10(2)	48(22)	32 (6)	62 (9)	64 (6)	57(6)
1977	25(4)	43 (5)	15(4)	13 (5)	21(4)	39 (6)
1978	21(3)	38 (4)	34(6)	54 (6)	23 (3)	62(11)
1979	27 (4)	35 (6)	30 (4)	38 (6)	45 (5)	40(6)
1980	28 (6)	24 (5)	37 (4)	15(3)	57 (5)	31(4)
1981	12 (5)	19(3)	14(3)	29 (5)	42 (5)	51(4)
1982	18(2)	21(5)	39 (5)	28(3)	46(5)	87 (23)
1983	71(5)	97 (5)	87 (4)	110(10)	124(5)	125(14)
1984						
	4(10)	31(7)	49 (15)	41(15)	-11(15)	32(8)
	Jul	Aug	Sep	Oct	Nov	Dec
1953	<i>Jul</i> 41(13)	Aug 53 (4)	<i>5ep</i> 29(6)	Oct 33(8)	Nov 32 (7)	Dec 8(8)
1953 1954	Jul 41(13) 6(6)	Aug 53 (4) 38 (10)	<i>Sep</i> 29(6) 17(6)	Oct 33(8) -8(4)	Nov 32 (7) 15 (8)	Dec 8(8) 25(12)
1953 1954 1955	Jul 41(13) 6(6) 46(10)	Aug 53(4) 38(10) 2(11)	\$ep 29(6) 17(6) 8(5)	Oct 33(8) -8(4) -9(8)	Nov 32 (7) 15 (8) 9 (4)	Dec 8(8) 25(12) 2(5)
1953 1954 1955 1956	Jul 41(13) 6(6) 46(10) 69(11)	Aug 53(4) 38(10) 2(11) 35(10)	Sep 29(6) 17(6) 8(5) 49(7)	Oct 33(8) -8(4) -9(8) 21(4)	Nov 32 (7) 15 (8) 9 (4) 69 (8)	Dec 8(8) 25(12) 2(5) -9(3)
1953 1954 1955 1956 1957	Jul 41(13) 6(6) 46(10) 69(11) 111(19)	Aug 53(4) 38(10) 2(11) 35(10) 39(11)	Sep 29 (6) 17 (6) 8 (5) 49 (7) 54 (7)	Oct 33(8) -8(4) -9(8) 21(4) 42(3)	Nov 32(7) 15(8) 9(4) 69(8) 35(4)	Dec 8(8) 25(12) 2(5) -9(3) 18(6)
1953 1954 1955 1956	Jul 41(13) 6(6) 46(10) 69(11) 111(19) 56(6)	Aug 53(4) 38(10) 2(11) 35(10) 39(11) 35(3)	Sep 29(6) 17(6) 8(5) 49(7)	Oct 33(8) -8(4) -9(8) 21(4) 42(3) 40(5)	Nov 32(7) 15(8) 9(4) 69(8) 35(4) 21(4)	Dec 8 (8) 25 (12) 2 (5) -9 (3) 18 (6) 27 (5)
1953 1954 1955 1956 1957 1958	Jul 41(13) 6(6) 46(10) 69(11) 111(19) 56(6) 26(2)	Aug 53 (4) 38 (10) 2 (11) 35 (10) 39 (11) 35 (3) 12 (3)	Sep 29(6) 17(6) 8(5) 49(7) 54(7) 31(4)	Oct 33(8) -8(4) -9(8) 21(4) 42(3)	Nov 32(7) 15(8) 9(4) 69(8) 35(4) 21(4)	Dec 8 (8) 25 (12) 2 (5) -9 (3) 18 (6) 27 (5)
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1953 1954 1955 1956 1957 1958 1959 1960	Jul 41(13) 6(6) 46(10) 69(11) 111(19) 56(6) 26(2) 38(3) 34(5) 33(2)	Aug 53 (4) 38 (10) 2 (11) 35 (10) 39 (11) 35 (3) 12 (3) 28 (3)	29(6) 17(6) 8(5) 49(7) 54(7) 31(4) 30(7) 28(2) 28(2) 26(3)	Oct 33(8) -8(4) -9(8) 21(4) 42(3) 40(5) 24(11) 23(4)	Nov 32(7) 15(8) 9(4) 69(8) 35(4) 21(4) 13(1) 27(5)	Dec 8 (8) 25 (12) 2 (5) -9 (3) 18 (6) 27 (5) 2 (1) 20 (5) 14 (2) 15 (2)
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Table 11. Net atmosphere - ocean heat exchange, Q_N . The standard error of the mean appears in parentheses to the right of each mean value. Units are watts/ m^2 . (Values may be converted to units of cal cm² day¹ by multiplying by the factor 2.064.)

1953 220(13) 193(13) 196(13) 152(24) 51(16) 142(10) 1955 194(13) 273(11) 164(22) 211(16) 192(20) 115(8) 89(10) 1955 194(13) 273(11) 164(22) 211(16) 192(20) 115(8) 1956 203(12) 226(25) 232(22) 150(15) 137(18) 79(9) 1957 238(11) 143(16) 176(16) 125(17) 103(11) 63(16) 1858 203(7) 146(9) 189(15) 171(10) 110(16) 81(8) 1959 236(7) 215(9) 155(13) 139(13) 125(18) 92(9) 1960 228(8) 220(4) 2096(6) 182(5) 153(4) 113(7) 13661 211(5) 221(4) 193(7) 175(4) 133(7) 83(6) 1962 210(5) 195(5) 216(6) 177(6) 135(6) 69(4) 1962 210(5) 195(5) 216(6) 177(6) 135(6) 69(4) 1962 210(5) 195(5) 216(6) 177(6) 135(6) 69(4) 1963 219(7) 213(5) 185(5) 156(0) 110(11) 104(10) 1965 190(8) 147(8) 144(4) 133(7) 33(9) 69(6) 1966 196(6) 192(4) 199(6) 156(10) 111(11) 104(10) 1965 190(8) 147(8) 144(4) 133(7) 33(9) 69(6) 1966 188(7) 179(7) 187(6) 145(9) 108(6) 66(5) 1967 183(5) 202(6) 186(4) 187(4) 157(5) 62(9) 1968 214(5) 196(5) 209(6) 164(5) 134(7) 192(10) 41(8) 1969 195(6) 209(6) 164(5) 134(7) 192(10) 41(8) 1970 185(8) 212(13) 203(7) 184(10) 130(7) 101(3) 1971 220(5) 219(8) 200(7) 158(9) 99(9) 67(11) 1972 205(5) 128(12) 150(11) 142(7) 77(10) 99(10) 1373 173(16) 203(11) 172(7) 171(11) 153(11) 95(13) 1377 137(16) 203(11) 172(7) 171(11) 153(11) 95(13) 1376 1216(6) 166(22) 179(9) 124(14) 79(9) 67(13) 1377 137(16) 203(11) 172(7) 171(11) 153(11) 95(13) 1376 1216(6) 166(22) 179(9) 124(14) 79(9) 142(7) 92(9) 174(6) 200(6) 128(13) 142(7) 92(9) 142(7) 92(9) 174(6) 129(14) 129(15) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(16) 129(1							
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1958 203 (7)	1957			176(16)	125(17)	103(11)	63(16)
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uncommon in the figure with the notable exception of the early 1970s and again in the early 1980s. The main point is that features in Fig. 4L seem unrelated to any major features apparent in the other series plotted in Fig. 4. Thus, the major effect of uneven distribution of reports appears to be in increasing sampling variance rather than in introducing long-term nonhomogeneity in the various time series.

Discussion

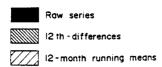
Since the 12-month running mean filter used to highlight the long-term variations in Fig. 4 incorporates no data more than 6 months previous or following, the indicated multiyear features are certainly real, and in no way represent artifacts of filtering and smoothing procedures. Moreover, the interyear variations of annual mean values tend to be of similar magnitude to the cyclic seasonal components (Figs. 2 and 3), making the separation of these scales in analysis of effects (e.g., on the biota) a difficult problem. For example, the impact of long-term variability will generally depend on phase relationships with the seasonal variation. Additional complications involve the adaptations of the biota, not only the long-term evolutionary adaptations of life cycle processes to regular cyclic effects, but also lagged responses of community composition, etc., to events of the recent past (see Mendelsohn and Mendo, this vol.).

This area of the world's ocean may be uniquely troublesome in these respects. Because the Pacific Ocean is so large, it is much less subject to continental effects which amplify seasonalities due to the low heat storage capacities of continents relative to oceans. The apparent consequence is much less forcing of Pacific Ocean processes to follow a regular seasonal cycle than may be the case, for example, in the Atlantic; the result is the dominance of interyear variation in the Pacific (Picaut 1985). The location so near to the eastern terminus of the equatorial wave guide results in a focusing of variability initiated in various portions of the great Pacific ocean-atmosphere coupled system to particularly impact the ocean habitat off Peru. Indeed, this may constitute part of the explanation for the enormous biomasses of pelagic fishes that have inhabited the region; i.e., because of the intense irregular environmental variability, a single, rather unspecialized fish species with very rapid population responses may be able to dominate the system relatively free from predation and competition from more specialized, less responsive species that would be more subject to the inefficiencies of multiple food-chain steps.

We have noted that the interyear variations tend to involve groups of years. In fact single features, e.g., the 1982-1983 El Niño, the 1954-1955 cold period, etc., so dominate the series that the entire series length becomes a dominant scale of variability. The result is that any sort of assumption of stationarity must be somewhat unrealistic; the real degrees of freedom useful for empirical analysis nearly vanish with respect to such features. It is also apparent from even casual inspection of Fig. 4 that the index series presented in this paper are all highly interrelated in terms of major interyear features, further exacerbating the problems of empirically sorting the various effects. Any available mechanistic constraints, provided by established physical or biological principles, that can be imposed on empirical analysis, would of course be very helpful in this situation.

Variable vs. Constant Transfer Coefficient Formulations

Some differences in the results of variable and constant transfer coefficient formulations in the wind stress estimates (Equation 1) and in the estimates of certain of the heat exchange components (Equations 4, 5 and 6) have been noted in the discussions of both seasonal and interyear variability. The differences have mainly been in magnitude of the particular index, with temporal aspects of the variability appearing to be relatively unaffected. An exception was the conductive component of heat exchange, QC, where the effect of stability in the atmospheric boundary layer introduced major discrepancies between the alternate formulations (Fig. 3E). Fortunately, QC is by far the smallest heat exchange component. Some summary information concerning gross effects of the differences in the various series with respect to time series properties is indicated in Fig. 5.



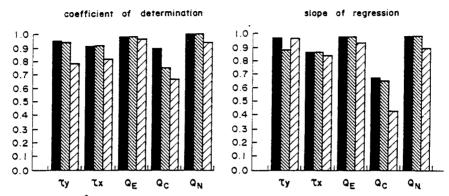


Fig. 5. Graphs of r^2 (= coefficient of determination, i.e., proportion of variation in one series 'explained' by other series) and slope of the regression of the variable transfer coefficient formulation versus the constant transfer coefficient formulation of alongshore stress (τ_y) , onshore stress (τ_y) , evaporative heat loss (Q_E) , conductive heat loss (Q_C) and net atmosphere-ocean heat exchange (Q_N) .

In the case of alongshore component of wind stress, the raw monthly series computed according to the two types of drag coefficient formulation are well correlated, each accounting for more than 95% of the variance in the other. When 12th-differencing was employed to remove the cyclic seasonal variations, the correlation dropped only slightly; this lower than expected drop in r^2 must be due to a strong seasonality in the differences resulting from the two formulations. Note that both the raw and 12th-differenced series pairs were much more highly correlated than the pair of 12-month running mean filtered series (which can be viewed in terms of directly proportional offshore Ekman transport in Fig. 4G). The slope of the regression of the variable coefficient alongshore stress series on the constant coefficient series is nearly one to one in the raw series; it drops to below 0.9 in the 12-differenced series, but is above 0.95 in the filtered series.

Slightly lower degrees of relationship are seen for the onshore component which tends to be much the smaller of the two stress components. The respective formulations of evaporative heat loss (QE) were very highly correlated in raw and 12th-differenced series. The degree of relationship fell only slightly after the 12-month running mean was applied. In the case of the conductive heat loss term (QC), the two formulations gave substantially greater differences, particularly after 12th-differencing or filtering. In the case of net heat exchange (QN) the differences between the results of the two formulations appear not to be appreciable. Note that in all cases the raw and 12-differenced series were more highly correlated between the constant and variable coefficient formulations than were the corresponding 12-month running mean filtered versions of the respective series; thus the degree of relationship is even higher in the case of the unsmoothed series, even after the seasonality is removed, than can be seen in the comparative examples of filtered series in Fig. 4.

In view of the time series similarities, the constant transfer coefficient versions of the respective index series are the only ones presented herein in tabular form (Tables 5, 6, 10 and 11). In view of the larger relative effect of the uncertainties as to proper formulation of the transfer coefficient for conductive heat loss, and because its very small magnitude makes it relatively unimportant in any case, no tabular series of QC is included. Of course, it would be possible to assemble the constant coefficient version of the QC series from the values in Tables 8 to 11.

Offshore Ekman Velocity of the Mixed Layer

In discussing the inference of Parrish et al. (1983) that the offshore Ekman transport should ideally be divided by the effective mixed layer depth, to yield the net rate of offshore transport of drifting larvae which are passively mixed through the layer, Bakun (1985) stressed the importance of the qualification "ideally". Ekman transport is estimated from relatively abundant surface wind reports, which reflect the fairly large spatial scales of atmospheric variation. Mixed layer depth may vary on much shorter oceanic length scales and must be determined from generally much less abundant subsurface observations. In cases where the estimate of effective mixed layer depth may be very imprecise, the derived estimate of offshore Ekman velocity of the mixed layer could constitute a less reliable indicator of variability in this process than the Ekman transport alone.

On long time scales, mixed layer depth and wind stress observations are likely to be substantially correlated. However, within any given month it is probably not too bad an assumption to regard observations used to estimate these quantities (surface wind and subsurface temperature structure) as largely independent samples of the respective monthly distributions, particularly since there will normally be many more surface than subsurface reports. In this case, combining the standard errors according to the rules for a quotient of independently observed quantities (e.g., Beers 1953) should provide a reasonable gauge of precision. Thus the ratio of the standard error to the monthly mean derived net offshore Ekman velocity of the mixed layer might be reasonably estimated as being equivalent to the square root of the sum of the squares of the respective ratios of the standard errors to the monthly mean values of the Ekman transport and mixed layer depth components of the calculation.

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